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Air Atomic Warfare

Complex operational problems confront the air commander in the tactical use of atomic weapons. Opening a comprehensive series on the employment of nuclear firepower in tactical weapon systems, two authoritative articles are to be found in the present table of contents. Maj. General John D. Stevenson gives a technical description and review of the Sagebrush exercise involving tactical air atomic weapons. Colonel Prescott M. Spicer examines the intelligence needs of the atomic tactical air commander and the alternate prospects he has of filling them through air reconnaissance.

All People Are Different
(It Says Here)

MAJOR GENERAL H. L. GRILLS

WHEN the winning of World War II became such an obvious certainty that the luxury of complaint could be afforded, a wave of criticism was directed toward the military establishment for its "mismanagement" of people. Some of this criticism was thoroughly justified. Because of inexperience, selfishness, indifference, laziness, or cowardice many people in the military service had misused or failed to exercise the authority with which they were vested by virtue of rank and position. Little consideration was given to the fact that these offenders were a small minority in an organization which, in spite of its very rapid expansion, included many thousands of officers and noncommissioned officers who had discharged their responsibilities with honesty and fairness. No apparent consideration was given to the proposition that the principles upon which an organization is built may be entirely valid even though a sudden increase in its numbers results in some breaching of its ethical structure.

Many of us in the service can blame ourselves for this mistake because we remained silent while a chorus of rancor for the military establishment claimed the ear of the American public. Worse yet, we allowed consequent legal circumscriptions of personal authority to acquire the stature of a mandate upon us to modify our methods of control to a degree that was neither necessary nor desirable. Suddenly it was no longer appropriate for officers and noncommissioned officers to *tell* people what to do. Clear-cut direction as a means of achieving unity of effort took a back seat to guidance and counseling, and the Air Force embarked upon a program of "permissive control" with which it still struggles ineffectually. The silly idea that people should *want* to do things they ought to do gradually progressed into the even sillier suggestion that people do, in fact, want to do the things they

ought to do and, finally, into the absurd notion that they *will* do what they ought to do if left largely to their own designs. This intellectual folly has been promoted by theorists who examine human nature in the light of what they would like for it to be, with little or no regard for human nature as it actually exists.

It is a simple fact of human nature that people do the things they ought to do only because of compulsion of one kind or another. For responsible people most of this compulsion comes from an inner source; it is a moral compulsion—a product of conscience, self-respect, a desire to be esteemed, or some other outlook acquired through proper training. For those with lesser senses of responsibility, compulsion from an external source is necessary. It is for this reason that we have laws, rules, regulations, and social mores that establish standards of conduct.

Unfortunately the establishment of a standard does not in itself provide any guarantee that everybody will meet it. It is effective as a measure of control only if a penalty is prescribed for failure to conform to it. A man's feeling of concern for the consequences of his actions is finally the determinant of his conduct. This is just as true in the case of the responsible individual as it is for the irresponsible one. The concern felt by a man of responsibility is ordinarily great enough to prompt him to do the right thing, while that felt by the irresponsible individual may or may not be of sufficient magnitude to keep him from doing the wrong thing. It does no good at all to attempt to becloud this basic fact with the mawkish contention that a man's failure to do the right thing can be traced to his low intellectual capacity, his limited opportunities for self-improvement, the unhealthy nature of his previous environment, or deficiencies in his earlier training. Such an argument is little more than belated affirmation of something which his failure has already proved—that he does not possess the inner compulsion necessary to influence him to do right,

Man, like Cleopatra, appears in infinite variety. With which diversity of temperament and character, leadership in the form of current personnel management may be detrimentally overindulgent. It is better, urges Major General Herbert L. Grills, to dramatize the individual's potential for achievement than to rationalize his failures. This potential General Grills would develop by concentrating on the commendable similarities that are to be found among men—the desire to meet high standards, a sense of fairness, a willingness to follow good leaders, an expectation to pay for mistakes—rather than by excessive concern with the infinite differences of individuals. To require responsibility develops the ability to discharge it. General Grills is Commander of Lackland AFB, Texas.

that his concern for the consequences of his actions leaves something to be desired, or that he needs more self-discipline.

How does a person acquire self-discipline? A disciplined life is a habit-pattern, of course, and few good habits are voluntarily acquired. They are products of training—training which in many of its characteristics is not always entirely palatable to the recipient. In fact, it is generally accurate to say that the foundations of self-discipline are not likely to be improved by an experience which does not exact from an individual an effort greater than that which he would voluntarily expend and which does not require him to reach for a degree of excellence which he would not ordinarily meet on his own initiative. Enduring personal satisfaction results only from a sense of constructive achievement, and, in most instances, the difficulties surmounted in the undertaking are a measure of the satisfaction which results. In any endeavor which society deems worthwhile, the successful contention with difficulty, with handicap, and even with hardship has a character-building influence.

Many psychologists do not agree with this point of view, but they cannot prove that it is wrong. They concern themselves extensively with the idea that every individual has a specific peak of tolerance for stress and with the unfortunate circumstances which can result when an individual's capacity for contending with stress is exceeded. They seem to concern themselves much less with the fact that one's ability to tolerate psychological pressure of any kind is likely to be increased only by exactions of experience which help him to realize that he can withstand pressure. It is possible that the professional curiosity which prompts their extensive study of human failure would be more productive of result if it encouraged them to devote more of their energies to inquiry into the question of what causes people to succeed. The theories which they have developed in justification of individual weaknesses have received widespread popular acceptance simply because man's capacity for rationalization prompts him to seize upon almost any explanation or excuse, plausible or not, for his failure to act responsibly. Parents avidly devour books and articles on child behavior in the hope that Junior's rebellious actions can be laid to some deep-seated psychological quirk rather than to their failure to act like parents. Welfare workers rush to the defense of juvenile delinquents, insisting that any antisocial behavior on the part of a youngster is due to his emotional disturbance. In criminal cases one psychiatrist as a witness for the defense presents abstruse professional opinion to prove that the

defendant is insane, while another for the prosecution presents equally obscure argument to prove that he is sane.

These half-baked theories, differences of opinion, and encouragements of rationalization have created doubts and confusion which have grown to dangerous proportions in the public mind. Even the serious thinker finds himself on the defensive. He recognizes that he is confronted with an oversimplification of a problem, and he knows that a disease is not likely to be cured by treatment of its symptoms, but he is reluctant to voice his disagreement with any proposition which is wearing the cloak of altruism. Others, whose consideration of the delinquency problem is less reasoned and who harbor a subconscious feeling of personal guilt because they themselves are doing nothing constructive about it, are willing to go along with almost any proposal which seems to offer remote possibility for improvement of the situation. Still others who feel little responsibility to anyone but themselves are entirely content to let matters remain as they are.

Since public attitudes are invariably reflected in the military service, these confusions of mind are evident in the Air Force. We have been almost submerged under a flood of books, manuals, articles, and slogans which have tried to tell us how to deal with people. Some of this advice can be used advantageously by the military man who has responsibility for the supervision of people. Unfortunately, however, much of it is just plain "malarky" promulgated by wishful thinkers who picture people as rational beings needing only friendly encouragement to ensure that they will always select the proper course of conduct for themselves. The introduction of this "laissez-faire philosophy" into the field of personnel management in the Air Force has produced one very interesting result—almost everybody considers himself to possess some competence in the field. This widespread presumption is perhaps a perfectly normal development when one considers the inordinate emphasis which has been placed on the idea that no two people are alike. This insistence provides each individual with encouragement to believe that he is, at least, an expert on personnel matters which concern *him*.

Unfortunately such encouragement can also produce a type of egocentric who believes that he, better than anyone else, knows what is *good* for him. This distorted point of view frequently causes its owner to think that only those rules of social and professional behavior which serve his personal interests should be applied in situations involving him, or that *all* of the rules should be adjusted as necessary to serve his interests. He does not much

concern himself with those things which serve the collective interest—they are matters for somebody else to worry about. He is concerned primarily with himself. He wears a thin veneer of cocksureness to hide his emotional confusion. He is not a stranger in the United States Air Force.

SELF-ASSURANCE growing out of a solid foundation of experience is a fine human quality, but it is not something which can be acquired through the exercise of selfish motives. Neither can it be acquired by exposure to unproven theories of human behavior, nor by any magic process of endowment. Genuine self-assurance results largely from triumph over fear, and it is finally a product of faith—faith in ideals, faith in institutions, faith in one's self bolstered by the confidence of one's associates, faith that is shared with others devoted to a common purpose.

We need a lot of this faith in the United States today. We need it especially in the Air Force. But we are not likely to develop much of it if we continue to indulge our preoccupation with the idea that, since all people are different, we must feverishly concern ourselves with every small nuance and whim of human nature that makes its appearance. Certainly all people are different—that fact is so apparent that it is almost a waste of time in the military service to talk about it. Few people even look alike. Even the physical differences between any two people we might select are so infinitely numerous that it would be impossible to catalogue all of them. Add to these the mental and emotional differences which exist and we have a total so incomprehensible that it has no practical value.

This is not to argue that these differences should be ignored or that attempt should be made to eliminate all of them. Many of these differences can be used to good advantage by the Air Force. The wide variations in intellectual attainment, personal interests, individual competence, physical attributes, and emotional makeup provide the basis for a broad occupational structure which can accommodate our ever-increasing military requirements. It would be foolish to suggest that we should try to mold the minds and bodies of people into one pattern. A program of conformity which seeks completely to destroy individuality has no merit.

But in any collective effort there is necessity for unity of purpose. This is especially true in the military service, where the

results of an undertaking may finally be measured in terms of life or death, victory or defeat, and national survival or extinction. Unity of purpose manifests itself in the military service as *esprit de corps*—a concurring sense of obligation to place the interests, the effectiveness, and the prestige of the organization ahead of the personal interests of any of its members. Unity cannot be obtained by catering to the differences of people to an extent which causes any one of them to believe that his individual circumstances are so distinctive as to entitle him to favored consideration. Such a practice inevitably encourages self-seeking—and self-seeking, if tolerated, rapidly becomes a contagious disease which can neutralize all other efforts to create unity.

What can we do to prevent the development and the spread of this disease? To what extent should we "make allowances" for the natural instincts of people to serve their own interests and how can we most effectively counteract the inclination of people to be guided by these instincts? How can we develop in people a readiness to subordinate their personal desires to the common interest? Most important of all, how can we stimulate people to rise above themselves—to enter upon that process of sublimation which can finally produce for them the maximum amount of personal satisfaction from their service?

I do not believe that we can do these things by devoting much of our attention to the multitudinous differences in people—to their selfish desires and to their weaknesses. It is an unfortunate but an undeniable fact that personnel administration in the Air Force has degenerated into the time-consuming process of concerning ourselves principally with the misfits, the delinquents, the weaklings, the self-seekers, the inept and maladjusted individuals. We spend so much of our time and effort on this small minority of people that we have little time and energy left for our good people and for those who have much potentiality for good. This is, in my opinion, a poor way to invest our leadership resources. It is not only unfair to that great majority upon whom we rely so heavily all of the time. It is a gross waste, because few of those who now receive so much of our attention could be depended on when the chips go down. It is also a dangerous practice because it tends to orient people in the wrong direction.

In any sizable cross-section of people there are always a few at the top of the heap who are so fine that they can always be relied upon to do what they ought to do. At the lower end of the scale can usually be found a few of low potential who have little or no inclination to use in a constructive manner the limited abilities which they possess. Those at the top require little supervision—

they are highly motivated, and most of their motivation derives from their own self-respect. Those at the very bottom are generally unresponsive to the influence of leadership—efforts to motivate them through leadership are, much more often than not, completely futile. In between these two extremes of people lies a large, amorphous mass of individuals who, because of their numbers, constitute the most important group of all—important collectively because they do most of the hard work. In many of these people motivation to contribute to the common purpose is sometimes in conflict with the impulse to serve personal interest. Consequently some of them are always looking in two directions in their search for a personal pattern of conduct. In most instances the choices which they make in resolving these conflicts are pragmatic judgments based on their assessments of the probable results of their actions. It is essential that these people be oriented toward the top. We must not give them any reason to believe that they can benefit themselves by following poor example. The Air Force must represent itself to its people in terms of opportunities and responsibilities—opportunities for responsible people to show what they can do.

We must promote the understanding that opportunity will be the reward of him who deserves it, that it will be denied to the undeserving, and that appropriate penalty will accrue to the transgressor. We must discourage self-seeking and place a premium on selfless service. We must base all of our personnel administration on broad fundamental principles which appeal to the better nature of people.

Such broad principles cannot be developed by an endless consideration of the infinite differences in people. They must be refined from the knowledge that most people possess in one degree or another the desire to emulate personal attributes which they can admire and respect. These principles must reflect a recognition and an understanding of the *similarities* of people—similarities of human nature on which leadership must depend if it is to be successful—similarities which, although they do not exist in all people in the same degree, are shared in majorities to an extent that they can be relied upon in almost every circumstance.

The commendable attributes and attitudes possessed by the great majority of people in almost any group are too numerous to list here, but my point can be made, I think, by stating a few and discussing them briefly.

▼ *Most people like to be expected to measure up to high standards.* This statement is so obvious that it needs little elaboration. It is in order to say, however, that many people will not set for themselves standards which are as high as they are able to meet. Some people will do no more than is expected of them. Consequently it is the leader's job to place requirements on his people—requirements which many of them would not ordinarily place upon themselves. Mental and spiritual capabilities, like muscles, develop only through exercise. Perseverance, determination, dependability, integrity, and courage are human attributes which can be acquired through training. A leader is obliged to prescribe courses of training, living and working schedules, rules of conduct, and standards of excellence which will help those for whom he is responsible to realize their potentialities for constructive achievement. They may object to these requirements while contending with them, but most of them will eventually look back on these experiences with pride and satisfaction.

▼ *Most people possess a well-developed sense of fairness.* It is doubtful that any man ever finds himself confronted with a circumstance toward which he can be completely objective in his thinking. The more directly he is affected by a circumstance, the more subjective his individual opinion about it is likely to be. It is not reasonable to expect a man to sit in judgment on himself in all circumstances—such an expectation places an undue strain on his sense of honesty and fairness. It is almost continuously necessary, however, for judgments on individuals to be made, and this necessity is a requirement on leadership. Fortunately for the leader, group opinion has much capacity for objectivity, and when provided with the proper climate for its development, it manifests an attitude of fairness which is helpful to the leader in arriving at his judgments. It is for this reason that the leader, before taking action in behalf of or against any individual, may need to concern himself more with the impressions which his action will create in the minds of those who hear about it than with the reception afforded it by the mind of the affected individual. He must try to ensure that, in his effort to be fair to the individual, he will not violate the group sense of fairness. While the possible group reaction may not always be a completely reliable indicator, it will normally justify any logical action the leader chooses to take. In the final analysis the collective response toward any action taken in the case of an individual will be a measure of the group's belief that the individual received the kind of treatment that he deserved. Treatment which is considered by

the group to be either excessively lenient or excessively harsh may require logical justification if it is to have a constructive effect. This is not to say that a military organization should be operated as a soviet or that the leader should engage in poll-taking as a means of determining his courses of action. There are instances in which it is necessary to make decisions which do not immediately receive a popular response. This is especially true when the decision places requirements on considerable numbers of people. But the group's over-all estimate of the leader's judgment and fairness is very important to his success. If that estimate is high, even his unpopular decisions will be received with some measure of confidence and approbation. He must establish for himself a "reputation" for fairness.

▼ *Most people like to be told what to do.* At first glance this statement may appear to be absurd. The independent nature of Americans is such that they almost automatically resent impositions of authority. They disregard traffic laws whenever they think nobody is watching them. In the minds of some, circumvention of rules and regulations assumes the stature of a sport. But in almost any undertaking demanding collective effort and with a requirement for planning and direction, most of the participants are willing for responsibility for the collective result to rest on others in whose judgment they have confidence. In other words, they *like* to follow good leadership. They want to be a part of a successful endeavor, but they *expect* somebody to tell them what to do. The leader who is reluctant to *tell* his people what to do is failing his obligation to those people. It is their right to receive direction because it is their right to expect the endeavor to succeed. In fact people in the military service are entitled to good direction whether they want it or not. The direction which the leader gives must be as explicit and as detailed as necessary to ensure the maximum degree of success for the undertaking. Instructions which are objectively issued with firmness and assurance, and without any show of caprice or arrogance, are strengthened by an implied expectation that they will be carried out.

People in the Air Force need more specific direction from all levels of command than they are now getting. The philosophy on which a regulation is based may properly be expressed as a broad principle, but the regulation itself should promulgate rather inflexible "derivatives of conduct" which are applicable to everybody. Much of the "broad guidance" which is disseminated in regulations today is a waste of the paper on which it is written. Statements of policy which do not include clear-cut expressions

of policy objectives and which are not bolstered by previously demonstrated intent and ability to enforce them are open invitations to noncompliance. Almost everybody has his own idea about the way the Air Force's business ought to be handled, but many of these ideas are conceived by people who have little or no final responsibility for the operation of the Air Force. Direction must emanate from the various levels of responsibility, and it must be positively expressed in a manner which will ensure uniformity of effort. Some of our directives are written in a "negative" fashion—they tell a commander of troops what must *not* be done but they don't tell him what he *can* do in dealing with his people. In some instances they prescribe "counseling" as a sole measure of control. While counseling certainly has a proper place in the military service, its effectiveness as an after-the-fact means of controlling human weaknesses is limited. It serves its best purpose when it advises people of the standards which they are expected to live by and of the consequences which will befall them if they violate these standards. It has little reformatory effect upon a delinquent unless it is accompanied by a pronouncement of retributive justice.

▼ *Most people expect to be required to pay for their mistakes.* Perhaps it would be more accurate to say that good people *want* to pay for their mistakes, and most other people expect to be required to pay for theirs. Only a few are so self-centered and irresponsible that they feel no sense of guilt after wrong-doing. Where a sense of guilt is present, the individual who has made a mistake is entitled to an opportunity to atone for it, and the person who is responsible for the individual's conduct is obliged to afford that opportunity. If the opportunity is not provided, the erring individual may be denied the emotional experience which is an essential step in his reformation. The prescription for payment may well be varied to fit the requirements of the situation and the needs of the individual, but to be constructive, it must ensure that the offender experiences regret to a degree which will cause him to engage in some soul-searching.

We are not fulfilling these requirements in the Air Force today. A convicted offender is sentenced to confinement at hard labor, but very few of our stockade prisoners perform duties which require real physical exertion. Because of the restrictions of law and regulations and the permissive philosophy which prevails, most of them work only at whatever odd jobs the provost marshal can find for them. Both the prisoner and the Air Force could benefit if he engaged in a constructive program of hard manual labor. Furthermore the current obsession with the concept of

open prisons, unarmed guards, and minimum restraint often encourages an unthinking youngster to compound his difficulty by escaping from confinement. When he is returned to custody after the expenditure of much time and effort by civilian and military law enforcement agencies, he is really in trouble—trouble which results in additional expense to the Air Force and perhaps in the lasting stigma of a punitive discharge for the offender. We have no right to relax our control over people to a point where they are encouraged to get into trouble. We have a moral obligation to the parents of our young Air Force personnel to place upon these youths a type of restraint which is at least as restrictive as that to which they would be subject in their own home communities. Many of them are youngsters away from home for the first time—free from parental restraint for the first time. We must provide for them the type of control, supervision, and direction that we would want our own sons to have in equal circumstances.

It would be possible to continue at much length the listing of constructive characteristics which people possess in common. Most people want to be well thought of, to be successful, to feel important and necessary to the endeavor of which they are a part, to be identified with an undertaking which is respected, to believe that they have earned the rewards which come to them. The opinions, the convictions, the aspirations, and the emotional impulsions which are shared by great numbers of people represent human attributes of great value to the leader in the exercise of his influence. His awareness of these attributes and the use which he makes of them determine his effectiveness as a leader. He will do well to remember that personnel management is an art and to realize that any effort to make an exact science of it is ridiculous. It is his job to encourage the strengths of people under his jurisdiction and to help them to conquer their weaknesses. While he must show some concern for their opinions and attitudes, he must endeavor to influence those opinions and attitudes in a constructive manner. All of his actions must emphasize the fact that dignity, prestige, and personal satisfaction can accrue only to those who possess a sense of responsibility.

Human nature changes very slowly, if at all. People react generally today in the same way that people have been reacting for many generations. Most of them will react favorably to the right kind of direction. In the final analysis our effort to develop

responsible people is the most important part of our job. Nobody has yet discovered a better way of developing responsibility in a man than to give him responsibility which he should be able to handle and then, if necessary, require him to discharge it. Standards for the measurement of a man's character are not subject to modification by the man himself or by anyone else. These standards, when correctly applied in the military service, promote the development of absolute spiritual values which command the respect and admiration of all honorable men. While we may properly acknowledge the need for the exercise of compassion in their application, we must never resort to expediency. We must continually strive to develop in all of our people a clear understanding of the transcendent nature of their military obligation. If we are successful, we will then have convinced them and the public at large that it is possible for a man to be obedient without feeling subservient, that demonstration of loyalty does not require sycophancy, that respect for superior authority is not an acknowledgment of inferiority, and that conformity does not entail a loss of individuality.

Lackland Air Force Base

Exercise Sagebrush

Massive Air-Ground Lesson in Atomic Warfare

MAJOR GENERAL JOHN D. STEVENSON

SAGEBRUSH was the largest joint exercise since the ones staged during World War II. The maneuver created a theater-scale setting in which simulated atomic, chemical, biological, and electronic weapons were extensively employed. The purpose of the maneuver was to further develop and test Army and Air Force units, weapons, tactics, techniques, and organization under conditions of atomic, conventional, and psychological warfare.

Sagebrush was based on a hypothetical situation in which "aggressor" forces secured a foothold on the U.S. Gulf Coast. With the United States and aggressor air and ground forces organized and deployed realistically, it was designed to simulate combat situations. This required air and ground actions of a type that could be expected in any possible major conflict in the future. Before we discuss its operational planning and combat details, a brief description of Sagebrush's background is appropriate.

Initial Planning

The USAF and the USA had committed their respective component forces, the Tactical Air Command (TAC) and the Continental Army Command (CONARC), to a major joint exercise as early as 1954. TAC was somewhat reluctant to commit the air effort necessary to properly support a major joint exercise. It was of the opinion that smaller exercises would achieve the desired training for Air Force and Army while keeping intact the operational capability of tactical air forces in the event of a general or local war emergency. When the Departments of the Air Force and the Army made the decision to hold the exercise, TAC

and CONARC set about formulating the plans and constructing a framework for the direction of the maneuver. Headquarters for the planning of the joint maneuver, now designated Exercise Sagebrush, was opened at Langley Air Force Base on 25 February 1955.

The purpose of the exercise as stated in the joint directive was to improve the ability of Air Force and Army units and individuals to perform combat missions in both joint and unilateral actions; and to provide similar testing of new type units, doctrines, techniques, procedures, and weapons.

General O. P. Weyland, Commander, Tactical Air Command, was named maneuver director through previous agreement between the Department of the Army and the Department of the Air Force. The joint directive prescribing the maneuver was general in its requirements but did stipulate that maximum attention would be given to free play, that atomics would be used plentifully with a slight nuclear advantage accruing to the U.S. side, and that ground forces would conduct a major river-crossing operation. It further stated that the maneuver director would *control* the air and ground forces of the opposing sides and would be assisted by an umpire group in evaluating and conducting the maneuver. General officers and senior colonels from the Army and Air Force were assigned to the staff and umpire group.

The operational concept was developed so as to provide for simultaneous air and ground campaigns. The necessary coordination and reconciliation in planning would be performed by the joint staff. Both Army and Air Force planners observed that, where neither service is subordinated to the other, no joint planning of operations really exists. At best there is only a reconciliation of operational problems, with true joint planning performed only in matters of support for operational plans.

No brand of air operations offers more complex and variegated problems than tactical warfare, with its targets often shifting rapidly in size, vulnerability, and location. Exercise Sagebrush, here described by Maj. Gen. John D. Stevenson, Director of Plans, Tactical Air Command, was the first opportunity for the Army and the Air Force to thrash out some of their independently-arrived-at concepts about the tactical use of atomic weapons and to see how they meshed in a large air-ground operation. The exercise put troops and air bases under atomic attack to show commanders and planners what they could expect in a future war. Sagebrush became a full-dress joint maneuver involving thousands of men, modern machines, and nuclear operations (simulated), designed to find answers to many of the questions plaguing tactical commanders since they gained atomic capability.

A fundamental point was the determination of exactly how much free play could be allowed in the conduct of the maneuver. Most previous exercises had been conducted according to a "scenario," with specific events prescheduled and positive control ensured by umpire control of the aggressor forces. The difficulty with this method is that a prerequisite for such control is a stabilized air situation. The air officers were the most outspoken in their opposition to such a concept for Sagebrush. The decision was finally reached that there would not be a definite or predetermined scenario; that the maneuver would be allowed to proceed, insofar as practicable, without undue interference from "topside"; and that the general tenor of the exercise would be manipulated through the allocations of resources and facilities and through control by the maneuver director of initiative and terrain. In the words of one of the Army commanders, we had "given the ball game back to the players." The comments from ground and air participants on both sides were extremely favorable on this point. The gain in realism certainly paid off in excellent training for Sagebrush's staff officers.

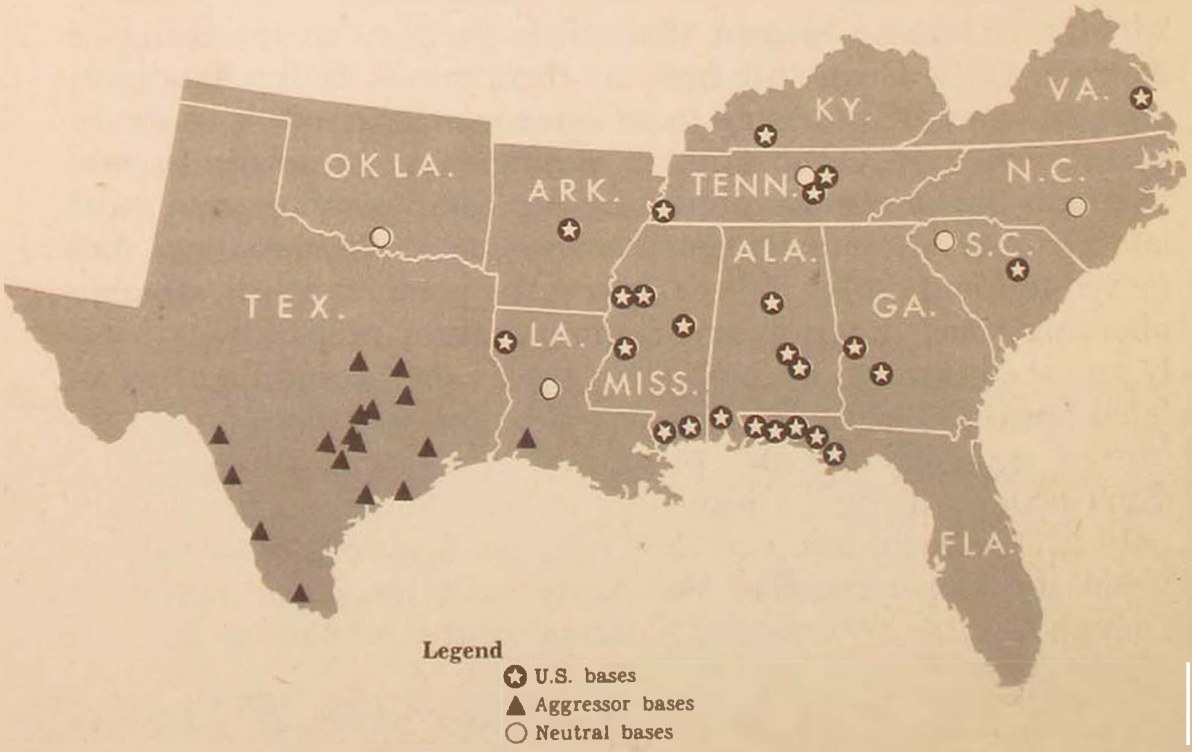
From the very outset one of the major problems was that of finding a maneuver area and the air base complexes for the participating forces. Originally Camp Polk, Louisiana, was selected as the maneuver site. When the Department of the Army and the State of Louisiana failed to arrive at terms for use of this area, attention was turned to Fort Hood, Texas. This was in March. In May it became evident that, with the painful memories of Exercise Long Horn still fresh in their minds, Texas landowners were not going to come to an agreement. Attention was once again focused on Camp Polk. Planning went ahead on a tentative basis but the land problem was not completely resolved until late October after the maneuver director's headquarters had moved to Camp Polk. The delay cost the planners much valuable planning time. Logistic and communication preparations barely squeaked through to completion before the beginning of simulated hostilities. In some cases the deadline was met only by resort to expensive "crash" programs. The moral is apparent—don't plan on holding a maneuver unless you have some place to hold it. The final terms reached with the State of Louisiana provided the Department of the Army with long-term rights on enough acreage in western Louisiana to obviate similar difficulties for at least a few years to come.

The planning for the use of air bases was equally fraught

with uncertainty and from this, of course, came even more uncertainty in communication planning. At a rather late date it was found that naval installations would not be available. Eventually enough bases were obtained to afford the U.S. forces the use of twenty-five air bases and the aggressor forces nineteen. Troop-carrier bases were considered immune to attack, as was England Air Force Base, Alexandria, Louisiana. The latter served as a forward terminal for reconnaissance and courier operations from rear combat bases and as the staging base for airborne operations for both sides. This artificiality, made necessary by the shortage of resources available for the maneuver, did a great deal to destroy realism. The maneuver's results have to be evaluated with this in mind.

Airspace was another problem that depended in large part upon the location of the ground maneuver site and of air bases. The agreement reached with civil organizations and authorities provided the military with all airspace above 20,000 feet and, except in terminal areas, with that below 4000 feet in specified areas. Special rules applied to the ground maneuver area. Nine Civil Aeronautics Administration controllers were placed on

Air Bases Used in Sagebrush



duty in the joint operations centers to assist in the routing and control of civil traffic within that zone. Separate agreements were reached with the Navy and with the Air Force that allowed comparatively free transit within allocated altitudes. It should be noted that some active combat bases—Langley, Shaw, and Turner —were outside the area of reserved airspace. This was because of a late decision to use them as active bases. Special rules applied for them proved acceptable during the course of the maneuver.

Organization, Doctrine, and Policy Planning

General Weyland wore three hats. He was simultaneously maneuver director and the theater commander of both the U.S. and the aggressor forces. He was in the enviable position of being unable to lose. His deputy commanders, Army and Air Force, also wore three hats, but had no staff to assist them in their unilateral theater commander roles.

The U.S. ground forces were composed of certain special forces, two paper field armies, and an actual field army. The latter had combat support troops, a field army support command, two simulated corps, and an actual corps. The actual corps had both active and simulated lower echelons. For air strength the U.S. forces were assigned two paper tactical air forces and an actual Twenty-ninth Air Force along with its combat and support units.

The aggressor ground forces also had special ground forces, two paper armies, and an actual Eleventh Mechanized Army complete with its divisions and combat support troops. To better simulate potential enemy organization there was no intervening corps between the Eleventh Mechanized Army and its divisions. Like the U.S. forces the aggressor had an actual air army, the Sixth, along with its assigned combat and support units.

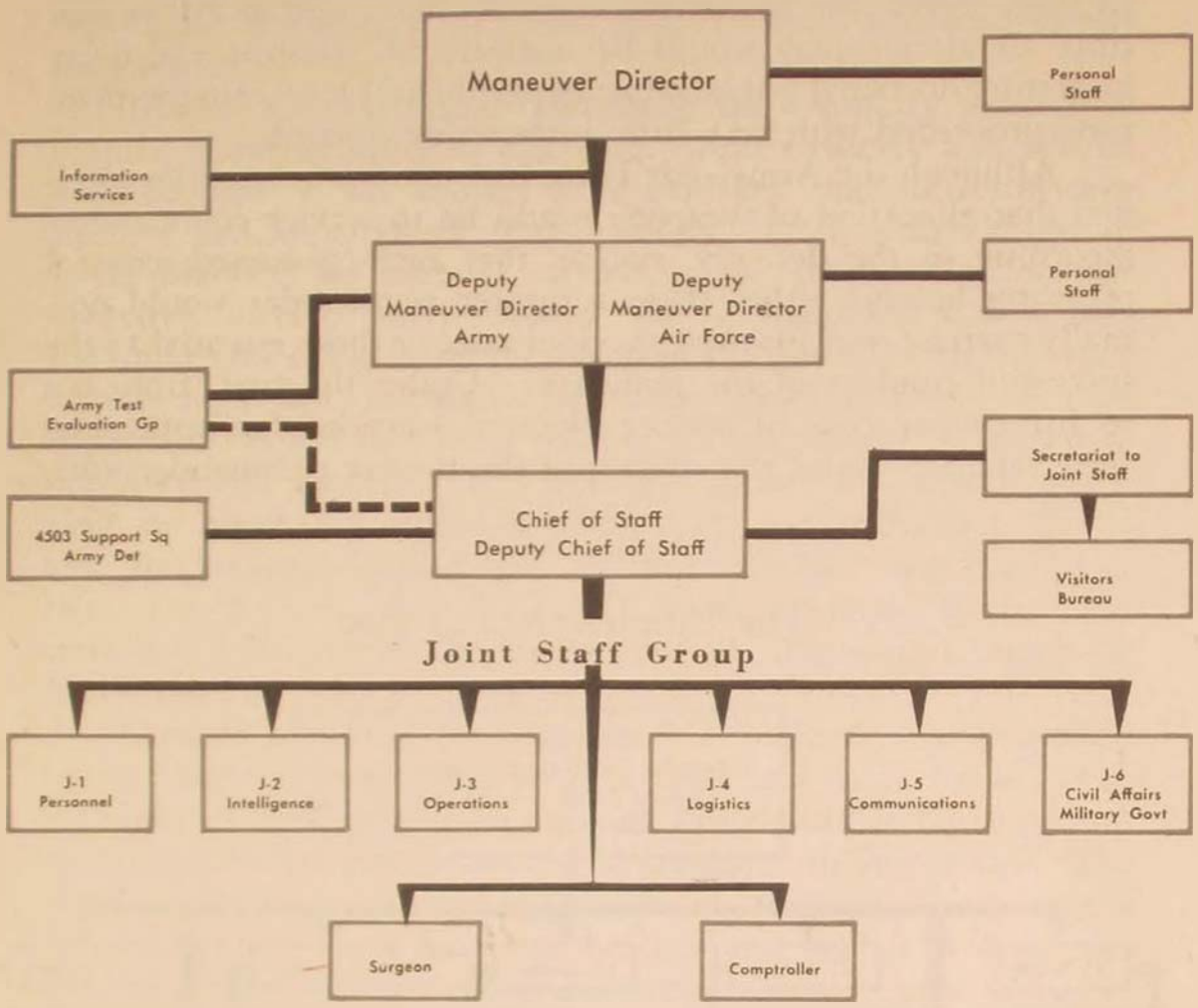
To ensure that the tactical air forces and field armies in this exercise were placed in a proper wartime setting, the scheme of maneuver envisioned additional flanking tactical air forces and field armies and the employment of a strategic air force striking deep at the enemy's heartland. Because the troop-carrier resources were so limited, the Eighteenth Air Force was retained as an entity. The deputy maneuver director for the Air Force, with the advice of an air transportation board, directly controlled airlift resources and allocated them to both sides.

To make the exercise one from which all participating forces would get the greatest possible training benefits and also to test tactics, doctrine, and organization, a joint concept of operations was necessary. Such a concept had to have a basic doctrine acceptable to both air and ground forces. The joint doctrine and procedures employed for Sagebrush did not have full approval of either the Department of the Air Force or the Department of the Army. Sagebrush's doctrine worked for the exercise, but it did not satisfy all combat requirements. Experience in Sagebrush did confirm the knowledge that previous air-ground agreements are badly out of date. Joint doctrine and procedures for air-ground operations should be worked out and approved as soon as possible. These should provide for the use of both conventional and atomic weapons and should apply to U.S. air and ground forces working together or with allied forces. If hostilities broke out before this could be done, Sagebrush's procedures could be used.

In practically all previous maneuvers the participating services entered the active or tactical phase of the maneuver with major items of joint doctrinal procedures still unresolved. This unfortunate state of affairs always led to impasses between the operating commanders, none of whom could hazard changes in doctrinal procedures contrary to those of his particular service. Both services were anxious to avoid such a situation during Sagebrush, and several specific steps were taken to prevent it.

In the first place TAC and CONARC agreed to the provisions of the long-standing joint training directive (JTD) as established between TAC and Army Field Forces (predecessor of CONARC) with extensions in particular fields such as aeromedical evacuation and control of Army aircraft. There were two exceptions: close air support, on which agreement could not be reached, and atomics, which were not considered because of basic disagreements at Departmental level. For close air support the maneuver director was empowered to make the rules. This he did by specifying in letters of instructions to the various commanders the provisions of the JTD. On atomics, after some jogging by the maneuver director because his planning could not proceed without terms of reference, the Air Force and Army agreed to an operational process. A compromise between the two service positions, the agreement stipulated that its use for Sagebrush would not prejudice in any manner future service positions on the matter. Essentially it supported the position of the maneuver director as the controlling agency for the conduct

The Maneuver Headquarters Staff



of the maneuver, and established the allocation of atomic weapons to service commanders according to the delivery means that each possessed.

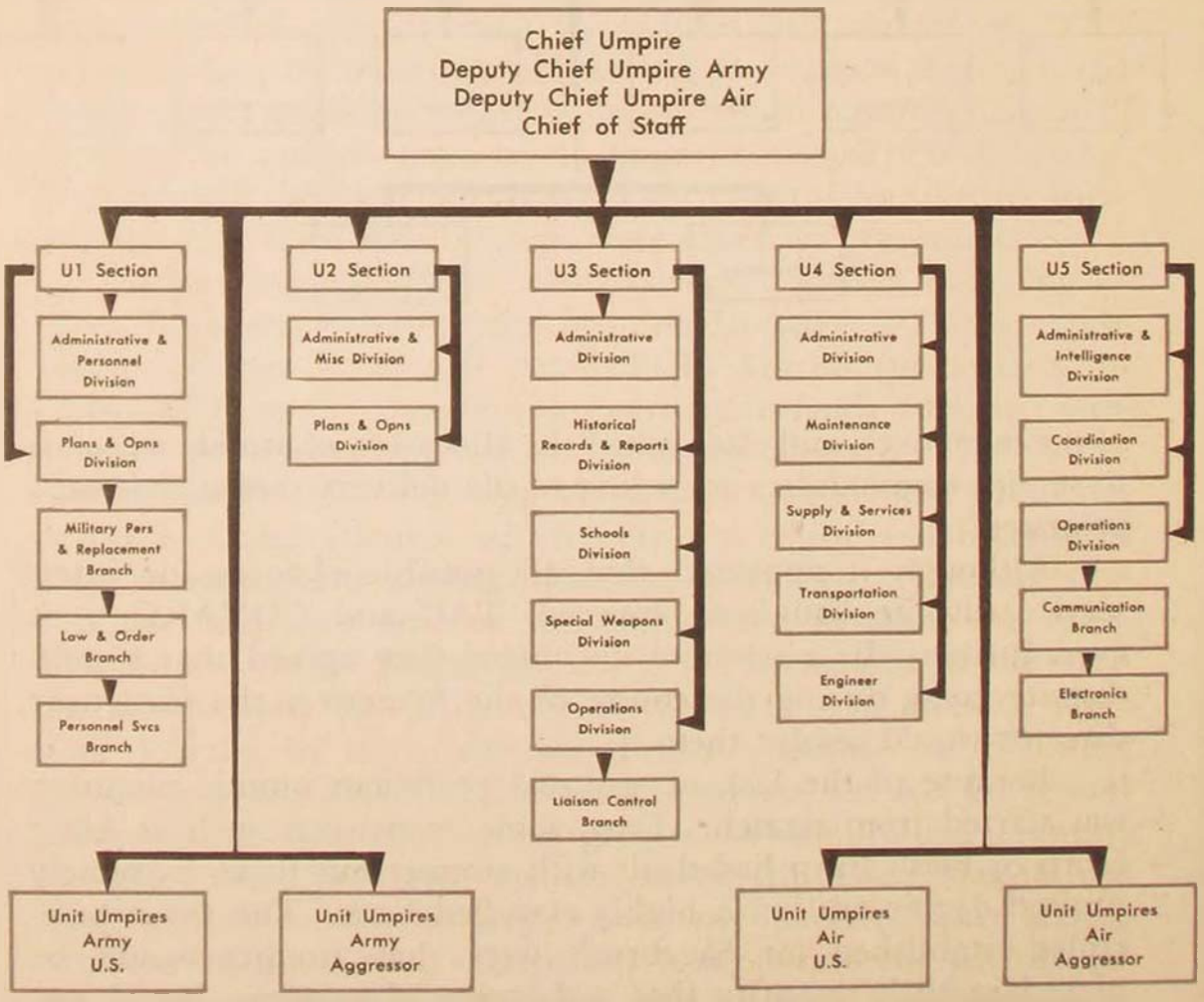
Although it appeared that all possible chances for inter-service dispute had been covered, TAC and CONARC went even further. In a separate document they agreed that should disputes arise during the course of the maneuver the maneuver director would resolve them.

Because of the lack of any real precedent atomic planning was started from scratch. True, some maneuvers such as Long Horn or Flash Burn had dealt with atomics but to an extremely limited degree and on a highly classified basis. The three principles established for Sagebrush were that atomics would be played in such quantity that a shortage of weapons would not

be a decisive factor in the operations of either side; range of yields and delivery means would be those assumed to be possessed by each service for the period through 1958; and as far as possible all atomic play would be unclassified. Despite the delay in getting doctrinal guidance at Departmental level, atomic planning proceeded with very little interservice discord.

Although the Army—Air Force instructions on atomics specified that allocation of weapons would be to service commanders according to the delivery system that each possessed, control measures became either those a theater commander would normally exercise over his most precious asset or those essential to the successful conduct of the maneuver. Under the first, from ten to fifteen per cent of service-allocated weapons for both sides were retained under the control of the theater commander (ma-

The Umpire Organization



neuver director) as a reserve. Also theater approval was required when any preplanned operation predicted expenditure of over twenty-five per cent of the remaining stockpile allocated to any commander.

Before leaving atomic planning, the corollary subject of umpire planning must be discussed. This coverage will not be detailed because the subject is so complex that it would take another article to cover it completely. From observations of Carte Blanche, an exercise carried on in western Europe, the maneuver director early realized that in simulated atomic play the important thing in umpire decisions is not so much that they be thorough, fair, impartial, or substantiated, but that they be instantaneous and that their results be immediately passed on to the interested agencies. This does not mean that the system devised for Sagebrush aimed at being unfair or haphazard. It did not. But its fundamental goal was quick decision and dissemination. For the most part these goals were obtained. Where they were not, monumental confusion resulted. This point cannot be overstressed in future maneuvers.

Umpire planning for atomics, like basic atomic planning, found itself wallowing without precedent in a void. An umpire's manual had to be developed to cover Army and Air Force play in an exercise where atomics would be employed in abundance. The terms of the manual were not foolproof. In some instances the "ground rules" were found to be unsound and in a few cases changes were made in the time between the two tactical phases of the exercise. The greatest drawback probably was that instructions for air umpiring and ground umpiring were covered in the same book. Separation into two manuals would have produced clearer instructions in a less weighty document. Operations people were recommending changes in basic assessment factors right up to and even after the manual went to press, but all in all the umpires produced an excellent document that can well serve as the groundwork for up-to-date umpire manuals for each of the services.

Freedom of play was the keynote in maneuver planning. Although the maneuver director had the authority to impose certain controls and limitations, these were to be kept at a minimum. Although the maneuver director and his staff had developed a concept of operations, there was no desire on their part to forecast or control the maneuver battle. The beginning of maneuver play was to find the U.S. and aggressor ground forces facing each other across a line of truce in southern Louisiana. The aggressor ground forces were to be located to the south of

the line and were to be organized for conventional ground operations under their own order of battle with no intermediate corps existing between army and division. The aggressor was to have both a slight numerical advantage in troops and the important element of surprise. The U.S. ground forces were to be located to the north, organized along the Army's organizational (ATFA) concept. The exercise was to be an important test to determine how well this type of combat organization would hold up in tactical ground operations.

Plan of Operations

The outbreak of hostilities was to begin with an attack by numerically superior aggressor air and ground forces in an attempt to destroy all U.S. forces, seize major communication and supply centers north of the Red River, and continue a general advance toward the north. The U.S. ground forces were expected to employ delaying tactics. Both forces were to employ atomic weapons, but because of the nature of the air battle (to gain air superiority) a minimum of close air support would be available in the early stages. With his numerical superiority the aggressor was expected to push the U.S. forces back across the Red River, forcing the U.S. ground forces to conduct a river-line defense, another test the Army wanted. Proper employment of armor and airborne forces during this phase would enhance the aggressor's opportunity for success. Success for the U.S. forces would be to cut off and destroy any aggressor forces that might move north of the Red River. At the end of this tactical phase the U.S. ground forces were to be increased by transferring some ground troops from the aggressor to the U.S. side and by giving the U.S. Twenty-ninth Air Force the advantage of surprise. The second tactical phase was to begin with the U.S. ground forces conducting a major river crossing, employing a new CONARC concept, and trying to drive the aggressor ground forces to the south. The U.S. ground forces were to have a capability for airborne and airlanded operations during this phase. Their ultimate success would depend in part on how they employed their conventional and atomic support, their river crossing, and their exploitation forces.

This summary was the maneuver director headquarters' version of what might take place and was not established as a scenario for what must happen. It gave the individual commanders and their units wide latitude to exploit their capabilities.

For the air operations the Air Force troop list allotted between 700 and 800 aircraft to the exercise. The aircraft were divided between U.S. and aggressor forces by type to facilitate recognition and control:

U.S.	*Aggressor*
F-84F—six squadrons	F-86H—six squadrons
RF-84F—two squadrons	F-86D—one squadron
F-86D—one squadron	RF-84F—two squadrons
B-26—two squadrons	F-100A—two squadrons
RB-66—two squadrons	B-57—two squadrons
KB-29—four squadrons	
TM-61—one flight	

Both forces were to have access to troop-carrier facilities, which included eight squadrons of C-119's, six squadrons of C-124's, one squadron of H-19's, one squadron of H-21's, with the possible addition of some C-123's. The type of aircraft allotted to each side gave that force both inherent strengths and weaknesses. U.S. fighter aircraft possessed an in-flight refueling capability that aggressor aircraft lacked. On the other hand the aggressor had jet B-57 light bombers capable of all-weather, high-altitude bombing. The U.S. bomber aircraft, the conventional B-26, although able to function as night intruders, did not have atomic capability. The B-57 was given a radar bombing capability that in actuality it does not possess. The U.S. forces were given two control and reporting centers to the aggressor's one. All jet aircraft participating in the maneuver, except those used for reconnaissance and air defense, were given a special-weapons capability.

Dispersal of aircraft was also planned on a different scale for each force. U.S. forces were dispersed a squadron to a base. In addition they were given an equal number of satellite bases, affording greater depth and dispersal while magnifying logistic and communication problems. Aggressor dispersal was half that of U.S. forces—two squadrons to a base with an equal number of satellites. This reduced aggressor logistic and communication problems but increased vulnerability. This balancing of the capabilities and limitations of weapon systems, ranges, and vulnerability of one air force against the other produced near equality of strength and operational capability.

An air incident, an attack upon a U.S. reconnaissance aircraft

over aggressor territory, was to trigger the maneuver war. The aggressor was to initiate air operations with an all-out atomic offensive. The situation was highly realistic. It might easily apply in a future war when an air commander facing an enemy armed with atomic weapons must operate from widely dispersed rearward airfields and yet maintain a high degree of mobility. Also the air commander must have an effective air defense plus long-range reconnaissance if he is to develop an efficient air order of battle. The core of the air commander's job was to find means of rendering ineffective the enemy's special-weapons capability while retaining an appreciable degree of his own like capability.

Training for a possible atomic war, the fundamental basis of Exercise Sagebrush, gave rise to tests that would analyze for both Army and Air Force the degree to which their atomic-war planning would prove successful. One of the Army's primary considerations was the proposed tests of the ATFA concept involving units up to and including a field army. The Army wanted to test several atomic-war concepts and systems in addition to ATFA:

- the organizational concept predicated on the requirements of dispersion, decentralization, and alternate means imposed by atomic war;
- the effectiveness of its proposed doctrine and organization for logistical support;
- the premise that tactical and logistical headquarters can function effectively as separate commands;
- a new ground communication system, a new integrated intelligence system, an air defense organization, a new river-crossing concept, and a new unit replacement system.

In considering the test program for the Air Force, Sagebrush planners polled all staff sections within the Tactical Air Command headquarters for recommendations. The results led TAC to the conclusion that there were two areas of particular concern to the Air Force:

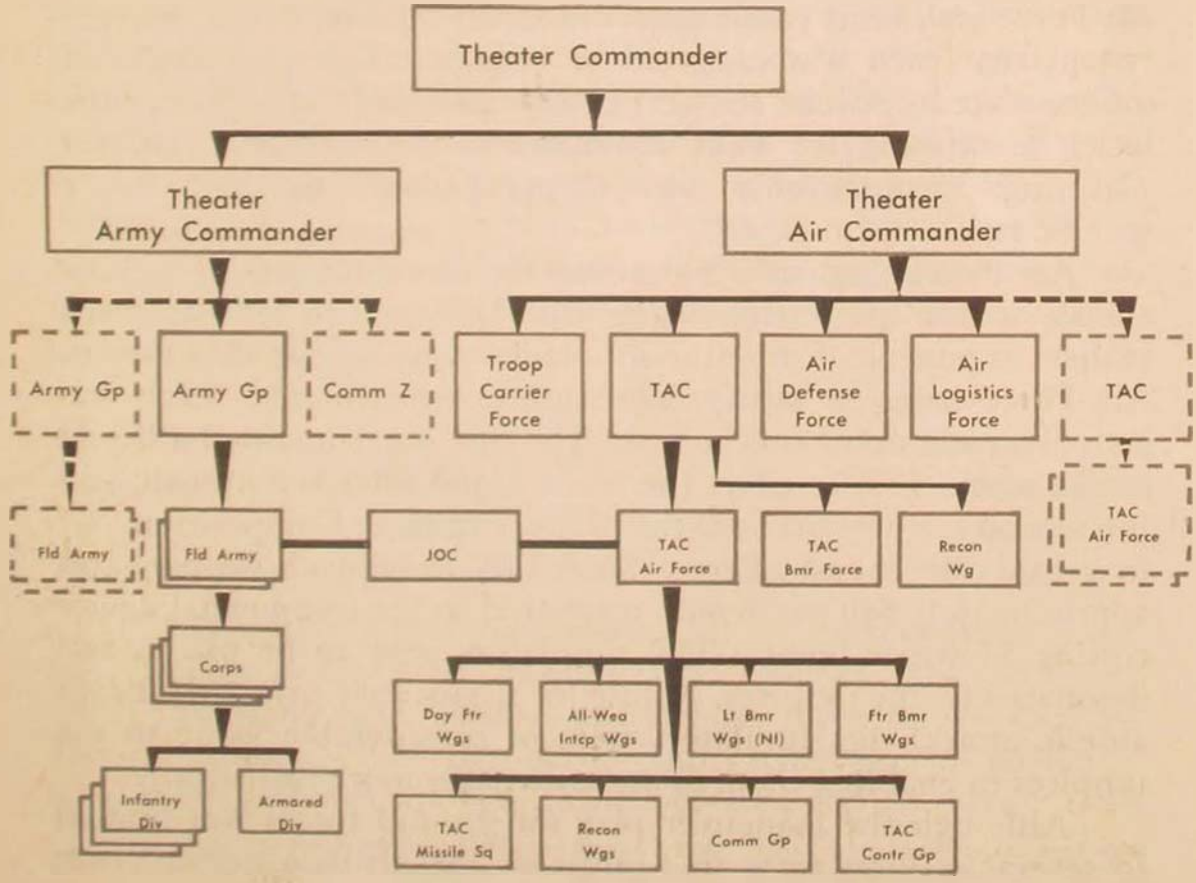
- tactical air operation against an enemy who possesses and employs nuclear weapons;
- operation of a mobile, nuclear-armed strike force.

The Air Force was interested in examining and gathering data concerning deployment in depth; desirable future organization of tactical air forces, headquarters, and units; air defense; and the adequacy of the present command structure for control of atomic defense. Also it was recommended to the deputy maneuver director

for air that the 405th Fighter-Bomber Group test its capability to execute its world-wide mobility plans. There were recommendations for many other tests, including ones on the effectiveness of missiles and manned aircraft in nuclear operations, on the most desirable proportions of nuclear versus conventional weapons in the delivery capability, on the targeting procedures for nuclear strikes, on fighter-bomber and bomber adequacy in night and weather operations, on the effectiveness of the new air liaison officer (ALO) net, on the forward air controller work, on the theater weather service, and on the new concept for theater air evacuation.

One of the maneuver director's responsibilities was to conduct an exercise that could be adopted as a basis for separate Air Force and Army tests. The deputy maneuver directors for Air Force and Army were responsible for planning, conducting, and reporting on the test program for their respective services. There were no

Sagebrush Theater Organization



specific joint tests scheduled for Exercise Sagebrush because the exercise itself was a joint test.

The fact that Sagebrush was the first major joint exercise geared to atomic warfare gave the planning staff very little to start with. From the outset plans were made to use the weapons that were expected to be available between 1955 and 1958. It was necessary to break down the weapons into "families" of yields for both U.S. and aggressor forces. This breakdown for each family had to be associated with yields, burst heights, delivery systems, and delivery errors. Then the number of weapons to be allotted to each side for the two tactical phases of the exercise had to be balanced against the roles of the forces to prevent a shortage of atomic weapons from becoming a deciding factor in maneuver play. Breakdown continued to the Air Force and Army by yields and allocations according to the delivery system. Once allocations had been made, the weapons were, for planning purposes only, apportioned by task: close support, interdiction, and counterair for the Air Force and fire-support for the Army. A certain number of weapons from both Air Force and Army were retained as theater reserve.

In accordance with an agreement reached between Headquarters USAF and Headquarters USA, weapons were allocated to Air Force and Army commanders in direct relation to the delivery system that each was expected to employ. The planning staff differentiated between the verbs "allocate" and "apportion," the latter identifying for field commanders the weapons that, for planning purposes only, were "apportioned" to them for a specific task.

An interesting side light was the development of atomic simulators for use during Sagebrush. Designed to lend as much realism as possible, forty-nine simulators were prepared at various Air Force bases to satisfy Sagebrush's requirements. Each was actually made up of two bombs. The first one contained a liquid smoke agent (FS) to effect the white cloud after the fireball, and the second one was made of the plastic explosive Composition "C" to create the sound effect. This TAC-developed weapon cost approximately $40 per bomb, compared to the commercial device costing $450 per bomb. The simulators were to be placed and detonated by the umpires. While for troops they primarily meant atomic attack, the simulators were of considerable value to the umpires in enabling them to assess damages more realistically.

Although the maneuver play for ground forces was limited to several million acres in Louisiana, the air-base network was

extended over a considerably greater area—from Clovis, New Mexico, to Langley AFB, Virginia. In order to service adequately all the facilities involved in the exercise an extensive network of commercial communication circuits was leased. The use of commercial communications was restricted to the minimum, but even so the facilities of the telephone companies were fully loaded. Teletypewriter circuit requirements were met by using Air Com-Net (Plan 51)* for both tactical units and umpires. With a total of 192 leased commercial circuits required to serve tactical air units and umpires, the estimated cost for a 45-day period was $267,377.

The communication system also had to be highly flexible. Modern warfare's need for dispersed, rapidly moving tactical units and the umpire teams' need for undelayed contact with maneuver director headquarters made communication flexibility a necessity. The latest equipment available to both Air Force and Army was used to satisfy this need. The basis for the system was the 23-channel AN/TRC-29 microwave equipment augmented with 12-channel wire carrier systems when required. Patching-switching centers (for plug-in connections) were established about every 25 miles along the microwave route, and spiral-four cables were extended to major command and umpire switchboards. With pre-maneuver installation of the spiral-four cables installed from each patching-switching center, by the time the maneuver began, communications with rapidly moving units could be established quickly. Umpire communication facilities were increased with approximately 950 vehicle-borne voice radios organized in 120 different nets. The problem of which frequencies to use in the highly complex communication system of Exercise Sagebrush was turned over to a joint Air Force—Army frequency control group in Washington, D.C.

Maneuver Play

Phase I. Movement to Camp Polk (31 October - 7 November)

Upon completion of the planning for the exercise, the maneuver director headquarters moved from Langley AFB to Camp Polk, Louisiana, and became operational there on 24 October 1955. Beginning on 15 October the units scheduled for participation began to move into the maneuver area and to the air bases

*Part of the Air Force Strategic Communications System. This system provides for a network of seven teletype relay points and numerous tributary points on a world-wide basis.

used for the exercise. After the final preparations the units in place were visited by the MDH staff, and on 6 November the maneuver director assumed operational control of all participating units.

Phase II. Command Post Exercise (8 - 14 November)

The CPX was designed to smooth out the communication system and to ensure proper functioning of equipment and systems during the tactical phases of the exercises. During the CPX messages, mostly of an injected intelligence nature, were prepared by MDH to keep the U.S. forces aware of the aggressor's preparations for eventual hostility. Unfortunately the CPX was not as successful as had been anticipated. Not all the needed communication lines were established in time, and there was a general reluctance on the part of the commanders to reveal their positions. Had the CPX not been held, however, the units might not have been as well prepared for the first tactical phase of the exercise.

Phase III. First Tactical Phase (15 - 21 November)

With the movement of MDH to Camp Polk an MDH operations center was then established. Because the maneuver director controlled both the U.S. and the aggressor forces, the operations center was designed to serve as a theater headquarters for both. Sagebrush had been designated a "free maneuver." Very few directives were issued from the operations center except those necessary to impose minimum control of the various tests being made. The center functioned more as a monitoring and informational agency.

As planned, a U.S. reconnaissance aircraft escorted by eight fighter aircraft was attacked by aggressor aircraft while operating north of the demilitarized zone on the morning of 14 November. This clash built up tension on both sides, and each began final movement and preparations for an all-out conflict. The aggressor forces had been given the prerogative of attacking at any time after 0001 15 November. At 1926 on 15 November the deputy commander of the Twenty-ninth Air Force (U.S.), General Viccellio, contacted the maneuver director: "Nine hostile aircraft have crossed over U.S. territory." With this General Weyland ordered "Batter Up" and released U.S. forces for defensive operations.

The all-weather and night-bombing capability that the aggressor air forces had in their B-57's definitely worked to their

Sagebrush Maneuver Area

The situation: enemy forces had established a foothold along the Gulf coast of the United States. In the vast maneuver area in southern Louisiana some 130 miles long and 30 to 70 miles wide, U.S. and aggressor ground forces faced each other across a truce line. Hostilities began on 15 November with a sudden air attack on U.S. air bases by aggressor B-57's. Under the "free maneuver" rules, aggressor forces advanced north to the Red River, crossed, and moved against U.S. ground bases. On 19 November realism was abandoned for training in air-ground operations south of the Red River. After regrouping and evaluation of the results of the first "combat" phase, U.S. forces went on the offensive in the air and on the ground. Both sides concentrated on close air support operations until bad weather brought a halt to the exercise two days early.

advantage. Within two hours of the initial attack the aggressor air offensive had knocked out 18 U.S. air bases. The only action taken by U.S. air forces during the opening hours of the first tactical phase was a counteroffensive attack with tactical missiles. This accounted for one aggressor air base and one radar station. Aggressor forces employed one-way missions for their long-range strikes at Shaw and Langley AFB, a type of mission that would not normally be expected of USAF operations during an actual war.

At daybreak on 16 November both forces launched air attacks

against opponent air bases. By the end of the day the aggressor had only 11 remaining. The U.S. forces had five left, all of which were rendered inoperative during the night by repeated B-57 attacks. The rapidity of successful attack and the destruction wrought by atomic weapons quickly outmoded the time schedule for conventional warfare.

For the next couple of days the aggressor reduced pressure on U.S. air bases, attacking them just often enough to nullify any appreciable counteroffensive. He diverted some of his air effort to reconnaissance and close-support missions. For the latter both conventional and atomic weapons were used.

By late morning on 19 November a decision was reached at MDH to abandon maneuver realism and go into training status to complete certain test objectives through umpire controls, administrative orders, and intelligence injection. This was done by giving the aggressor air forces information on the U.S. bases in commission, by umpire action allowing zero error on all aggressor missions launched, and by the injection of intelligence information that gave the aggressor four bases from which to operate.

The test objectives included close air support for aggressor operations to catch U.S. forces south of the Red River, resupply of the covering force, and evacuation of the U.S. covering force. Any U.S. bases coming back into operation during this period were to be knocked out immediately. Although aggressor air went into maximum close air support of ground operations, results of that support had not been assessed when the U.S. troops were ordered back into the river-crossing phase by administrative action. Barriers were withdrawn to permit aggressor ground troops to advance rapidly toward the river, and bridges lost to air and ground action were restored.

Phase III of Exercise Sagebrush terminated at 0600 on 22 November with what the maneuver director termed "excellent results." General Weyland commented very favorably on the enthusiasm and initiative that were shown throughout the phase. He was of the opinion that air-ground teamwork had been excellent.

Phase IV. Reconstitution of Forces (22 - 27 November)

During this phase both aggressor and U.S. forces returned south and north of the Red River respectively and observed an administrative truce. The two live air forces, the Sixth Air Army and the Twenty-ninth Air Force, maintained the air order of

battle that had been established for Phase III, while ground forces were shifted to give the U.S. numerical superiority during Phase V, the second tactical phase. On 26 and 27 November limited aerial reconnaissance was permitted and ground patrol activity was initiated in enemy areas along the Red River.

Phase V. Second Tactical Phase (28 November - 6 December)

The aggressor forces had been given the all-important element of surprise during the outbreak of hostilities in Phase III. For the second tactical phase MDH authorized the U.S. forces to launch their attack any time after 0001 on 28 November.

The U.S. forces notified MDH that H-hour would be 0900 on 28 November. Because of adverse weather forecasts and the desire of the army commander to reconnoiter aggressor troop deployment, H-hour was delayed to 0800 on 29 November.

At 0834, the Sixth Air Army reported several hostile radar tracks to MDH. When the maneuver director was convinced, at 0857, that the aggressor had definite proof of a U.S. attack, he passed the code word releasing the aggressor forces for counter air and ground action.

The U.S. forces launched a total of 51 atomic air strikes and two atomic tactical missile strikes. By the early evening of 29 November the U.S. had destroyed 18 of the 19 aggressor air bases. It was fairly clear that decisive air action was accomplished within four hours—a major lesson learned by that time in the exercise. Kiloton-yield weapons put many of the bases out for the remainder of the maneuver. The aggressor managed to launch enough strike aircraft to knock out 15 of the U.S.'s 25 air bases, but the U.S. neutralized the one remaining aggressor base through conventional B-26 strikes during the night of the 29th and knocked it out by an atomic strike early in the morning of 30 November.

From that point on the U.S. air forces enjoyed air supremacy. This they exploited by providing close support to U.S. ground forces. Adverse weather conditions soon hampered these operations, and on 1 December the decision was made to halt the counterair war for 72 hours. Beginning at midnight on 1 December, U.S. air forces engaged in close air support, armed reconnaissance, and interdiction operations while the aggressor was restricted from conducting any maneuver missions for a period of 48 hours. At the end of this time the aggressor air forces were given a 24-hour period for the conduct of similar operations while the U.S. air forces stood by. The purpose of this activity was to

provide training for the forward air controllers, air and ground liaison officers, and air units in close support and to exercise the entire air-ground operations system.

Although regular air maneuver operations were to resume at the termination of the 72-hour training period, adverse weather severely restricted close air-support operations. An airborne operation scheduled for the morning of 2 December had to be postponed until afternoon. Even then weather conditions were marginal. With clearing weather on the morning of 4 December full-scale close air-support operations were begun by aggressor air. But because of factors affecting Army operations and the pace of the ground action, the maneuver director ordered the exercise terminated as of 1800, 4 December, two days earlier than scheduled. This termination canceled the plan for the counterair battle. Had the air war been resumed, it was anticipated that the U.S. atomic strikes would have denied the aggressor forces the use of their airfields. On the other hand if poor weather restricted U.S. daylight attacks with fighter-bomber aircraft, it is possible that the aggressor, given a few hours respite, could have launched sufficient B-57 atomic strikes from a "recovered" air base to knock out the U.S. bases entirely.

Comments and Observations

Phase VI of Exercise Sagebrush was devoted to critiques for key military personnel who had participated in the maneuver. Unilateral Air Force and Army critiques were held on 8 December, and a joint critique was conducted by the maneuver director on 10 December. The maneuver director headquarters closed at Fort Polk (Camp Polk became a permanent Army installation on 1 November) at midnight, 11 December, and reopened at 0001, 12 December at Langley AFB for the purpose of preparing the final report.

Many recommendations were made as a result of the exercise. Areas in which present operational methods appeared inadequate or where poor coordination seemed to exist were thrown open for further study. The experience gained from an exercise in which atomic weapons played such a large part resulted in changes of opinion about established policy and doctrine. The impact of such weapons has been far-reaching. In cases where Sagebrush has not revolutionized thinking on air-ground operations, it has confirmed theories.

Exercise Sagebrush was the first major joint maneuver during which tactical air forces had operational control of atomic weapons. The decision to grant this control was reached at higher headquarters because of the inability of TAC and CONARC to reach an agreement. The procedures directed by USAF and concurred in by Department of the Army were flexible enough to permit the planning and execution of a joint training mission. For instance, where in previous exercises the time involved in getting approval for the use of atomic weapons from higher headquarters had plagued atomic operations, in this exercise the time lag was cut down considerably. Do not think that all control was relinquished. Whenever a major commander wished to expend more than 25 per cent of his remaining allocation of atomic weapons, he first had to secure the approval of the theater commander. Whenever he wished theater reserve weapons earmarked for his use, he also made his request to the theater commander, stipulating target, time, and the effect of the proposed strike on the over-all tactical situation. Contaminating bursts within the ground maneuver area required prior approval by the theater commander.

Direction was also received from the Secretary of the Air Force regarding the use of the Army helicopters in the testing of Skycav. The Secretary directed that the maneuver director permit this test, even though he agreed with the position and principles upon which the maneuver director had based his prior refusal.

Reporting completely saturated the communication system, particularly during the critical first few hours of Phases III and V. Since it is very important to know the status and location of all aircraft, crews, weapons, and air bases, the reporting system should be designed so that only these vital items of information are reported.

The importance of time in modern atomic war cannot be overestimated. Exercise Sagebrush made this plain. Established coordination procedures do not appear to lend themselves to a flexible and timely reporting system through which a theater commander is constantly and immediately aware of the resources that remain available for his use in continuing the air war. Over-all control of atomic weapons would probably be at the theater TAC level, with some operational control delegated to the numbered air forces. Present established doctrine gives no consideration to a formal joint planning and operational facility between Headquarters TAC and the Army Group Headquarters.

Present air-ground doctrine is inadequate in a number of

aspects. It ties a tactical air force to the support of a field army, denying to the Air Force one of its most valuable assets: flexibility. The doctrine limits the operations by supporting air power to the field army area of approximately 100 miles in width and 200 miles in depth. Also, the positioning of the headquarters of a tactical air force, the headquarters of a field army, the joint operations center, the tactical air forces reconnaissance wing, and all their supporting units in close proximity to each other is not practical in the age of atomic warfare. In modern war dispersal is mandatory for survival.

It appeared that relaying operational orders through several headquarters to the operational unit is too time-consuming in atomic warfare. In addition when units of like capability are deployed together in the same area, the destruction of that area by enemy action might very well nullify the air commander's ability to continue balanced operations.

Deployment in depth is a must. Depth in an atomic war demands that even the most forward air bases must be located a considerable distance to the rear of the actual lines. Especially is this true when air bases are required for launch and recovery. Dispersal is necessary to provide both protection through air defense and protection from ground fire and air attack. Exercise Sagebrush demonstrated the need for depth when those air bases near the "front" were made inoperative almost immediately upon the outbreak of hostilities.

The dispersal techniques of the field army and the tactical air force have become incompatible as lately developed. The field army deploys its units in a manner that does not provide as much linear coverage as previously but does provide more coverage in depth. On the other hand a tactical air force must deploy so as to gain more linear coverage, but for survival it requires considerably greater dispersal in depth than the field army concept envisions. Because the tactical air force has the responsibility for air defense of the airspace covering the field army's ground area, this poses a real problem.

Air Force units participating in Exercise Sagebrush were dispersed in an area from Langley AFB in the east to Laughlin AFB, Texas in the west. The pattern of dispersal, not the most desirable, was based on the availability of air bases for the maneuver. As long as tactical air forces are required to use lengthy (7000 to 10,000 feet) runways, they will be almost totally dependent upon radar detection of enemy approach and the ability of

the air defense system and ground fire to neutralize the initial attack. One alternative is vertical dispersal, making aircraft available after the attack at bases that have not been knocked out. All this emphasizes the need for a highly alert status of our air forces.

Under the present mode of operations the joint operations center is located in the tactical air force headquarters, which in turn is located in close proximity to the field army headquarters. With emphasis on dispersal and deployment in depth, it follows that the organization of the tactical air force headquarters deserves further study. During the joint critique tactical air force commanders and ground commanders suggested that changes in composition and location of the JOC warranted consideration.

Coordination with a field army concerning targets which, if destroyed, might impede the advance of the ground forces has always been practiced by tactical air forces. Bridges and highway complexes are included in this category. Flak suppression by Army weapons was also a matter of coordination in close air support operations. With an atomic capability now available in the tactical air forces and in the field armies, the coordination required has necessarily expanded many times. Finally, the contamination of airspace and ground area following an atomic attack has an impact on both immediate and future tactical operations.

AIR SUPERIORITY has had a different meaning as a result of Exercise Sagebrush. No longer does the force with numerical air superiority alone necessarily enjoy air superiority. Air superiority cannot be established as long as the opposing force retains any bases from which to launch a strike force with an atomic capability. One of the most important lessons learned from the exercise was that the force initiating the attack attained a tremendous advantage. In fact in both tactical phases the force initiating attack was able to attain and maintain air superiority and to win the counterair war. Although initiating an attack is not recommended, an operational concept that will give friendly forces a chance of survival during the initial phase of a nuclear war is very much needed.

Sagebrush was most worthwhile for training. It strongly brought out the fact that in any operation there are matters of joint Army-Air Force concern that must be resolved if we are to have the type forces and the doctrine we need in this atomic age.

The play of Sagebrush included many artificialities. It did not include all the forces typical of a theater of operations. For example, air defense forces were barely represented and then only

in Phase III. Logistical and engineer troops for the Army were very limited. The tremendous influence that other major forces such as Strategic Air Command and the Navy could have had upon operations was not represented.

A great deal was crammed into a short period of time. This article has covered only the high points of Sagebrush. Because of the artificialities injected the exercise's information and results must be carefully analyzed and be used only as guidance in our current and future thinking and planning.

Headquarters Tactical Air Command

Tactical Reconnaissance for Atomic Commanders[1]

COLONEL PRESCOTT M. SPICER

IF WAR is forced upon the United States, the tactical atomic strike commander will face many grave decisions early in the air battle. Within a few hours he will have to appraise the result of his first strike against preplanned targets, evaluate the threat of enemy counterattacks, and establish target priorities for his second wave of attacks. Because of his limited resources in aircraft and weapons the survival of his force, sector, or theater may depend upon his immediate decision. Unless he is assured of timely, coordinated, and high-quality aerial reconnaissance, he may have to act without essential facts or knowledge of alternatives and commit his resources by blind guesswork or instinct.

In view of the growing military strength and aggressive attitude of the Soviet Union and her satellites, it appears unlikely that the United States can reduce its atomic retaliation capabilities or revise its military planning in favor of conventional weapons alone. It will continue to be dangerous to assume that even small-area warfare may remain both small and conventional. Thus we face the possibility not only of a premeditated major air strike against the United States but also of local, conventional war that might expand into a multination conflict involving weapons of mass destruction. The theater commander may quickly become involved in atomic strikes and counterstrikes shortly after the initial use of atomic weapons in any part of the world. Accordingly he and his subordinates must meet boldly the need for tactical reconnaissance within a few hours after the outbreak of either a general war or a theater war involving atomic weapons.

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[1] This article is intended for the users and customers of tactical reconnaissance—primarily, the theater commander and his subordinate air commanders who may direct atomic strikes. Readers who are familiar with technical details or with the research and development of reconnaissance systems will recognize that only general ideas and concepts are presented. Reference to specific systems, in use or soon to be available, has been deliberately avoided to protect security information.

Since most initial strikes would be conducted against preplanned targets, the first requirement on tactical reconnaissance would be to assess bomb damage inflicted by the first strike wave. Only with this intelligence can the commander determine the degree of success or failure of his first strike and estimate the probability or magnitude of enemy atomic counterattacks. Almost simultaneously there would be a need for widespread aerial reconnaissance to search for new targets that might threaten his survival. Previously undetected airfields, for example, might present as great a threat as those in the preplanned targets. Only by knowing both the destructiveness of his first attacks and the number and types of new targets confronting him can the air commander select second-wave targets and allocate his aircraft and weapons resources. Since the first and second waves of attack may be separated by only a few hours, the acquisition, interpretation, and dissemination of aerial intelligence make up a formidable task indeed.

*Usable Forms of Intelligence**

It seems unlikely that the potential use of atomic weapons will lessen the reconnaissance requirement. On the other hand, it is certain that parallel advancement in atomic carriers, navigation systems, and bomb-delivery techniques will lead to equivalent changes in reconnaissance equipment and intelligence collecting media. The atomic commander will no longer need detailed prestrike analysis of target structures, as was needed in World War II when he had to choose between general purpose and fragmentation bombs or decide the optimum setting for nose and tail fuses. Yet the atomic commander will need equivalent information on the relative "hardness" of the target structures or the presence and characteristics of subterranean structures so that the best bomb size and height of burst may be determined. Similarly, although the atomic commander may have available weapons of great area coverage for any one target, his determination of target priorities will depend on his knowledge, for example, of the type and number of aircraft on an enemy air base; similarly his weapons choice may depend on his knowledge of the area of dispersal of the potentially threatening enemy bomb carriers.

These types of information, although different in detail from

*Although ferret or electronic flights and synoptic weather sections are usually included in tactical reconnaissance, this paper will deal only with the photo reconnaissance. It is related most directly to the atomic target problem.

World War II reconnaissance, still represent the same general need for aerial reconnaissance for the launching of atomic attacks as was required for conventional bomb attacks. The change from conventional aircraft and day visual navigational techniques to jet aircraft with all-weather navigation and bomb delivery capability, however, will lead to an equivalent change in reconnaissance methods and, to some extent, to a shift from conventional photography to a medium more nearly resembling the radar equipment used for navigation. This means a change in reconnaissance systems from photographic to microwave, at least for those portions of the reconnaissance mission that pertain to navigation and to bomb delivery.

In designing the reconnaissance capability to meet the requirements of the air-strike commander, the planner must seek the cheapest and quickest means available. There are many alternatives at hand. For example, agents located near target areas could provide information. But this source would be potentially unreliable and impossibly slow during the early phases of the air battle when the commander must make decisions within a matter of hours. It seems much more practical to dispatch observers or intelligence recording devices to the target or search areas.

The aerial eyewitness could be an important source of intelligence about atomic-bomb strikes. High- or low-level visual attacks by bomber crews or fighter-bomber pilots may provide both strike reports and damage analyses of sufficient accuracy to verify the destruction of a primary target. Equipping the strike aircraft with cameras would enable the aircrews, under favorable target weather conditions, to bring back photography revealing bomb-strike accuracy and damage. On the other hand the low percentage of missions during which aircrews could visually observe or photograph bomb detonation would make these techniques unreliable. The air commander could not count with certainty on strike aircraft furnishing him with essential information for bomb-damage assessment.

Without going into classified methods of attack and bomb delivery, most readers will recognize that a verbal recording on tape or wire by the attacking pilot could yield very useful intelligence. A narrative description of terrain landmarks, key points, and initial points together with data on bomb release could upon analysis reveal a reasonably accurate estimate of the bomb-strike point and the resulting damage. The problem, of course, is to devise a system that provides useful information, yet is simple

enough for the busy pilot to perform in the split-second conditions of jet flight.

Although visual or direct photographic recording of the strike might be unreliable in bad weather, certain types of strike missions could provide very useful intelligence by photographically recording the radarscope image in the strike aircraft and by recording data pertaining to the radiation pattern during the period of nuclear reaction. With these combined data the air commander could make a reasonably accurate analysis of the bomb-impact position or ground zero relative to the target. Of course in certain bomb-delivery techniques the strike aircraft will be too far from the ground-zero position at the time of explosion to obtain usable data. Because of weather factors and blast-evasion maneuvers, this system obviously cannot be relied upon exclusively to assess bomb damage.

Therefore it seems essential that special post-strike reconnaissance missions be sent into the target area. Such missions will face not only the weather problems confronting the strike missions but additional difficulties such as residual radiation and target concealment by atomic debris and fire and smoke. These factors, weighed against the strike commander's need for information within a few hours of the strike, make the timing of the reconnaissance mission a most complex problem. But the high potential value of aerial photography or of the newer electronic reconnaissance systems still indicates that this method will be the best for the air commander's use.

Analysis of Target Intelligence

High-quality, i.e., high-resolution, aerial photography provides the intelligence officer and the air commander with the best practical means of determining a wide range of data concerning a new target or one previously attacked. A simple, visual scan of the photograph will reveal obvious damage such as postholing of runways or major areas of fire damage. For more detailed analysis the photo interpreter has a number of techniques. Using sun-angle tables and trigonometric analysis he can determine the height of buildings and structures or the depth of craters and subterranean damage. Using stereoscopic pairs of photographs he can readily scan large areas for damage assessment. By compiling these and other measurements the intelligence officer can very accurately appraise the success of a mission or the need for secondary attacks.

Radarscope or microwave photography is inferior only to

conventional photography in providing target information or damage analysis. Although it produces in effect a synthesis of the target, an acceptable analysis of target damage or destruction can be made if accurate radarscope photographs of the target prior to the attack are available for comparison. In searches of unexplored areas for new targets this microwave technique may be less practical than visual photography because of the lack of prior "comparison" radar photographs. Nevertheless this system for bomb-damage assessment has great promise and must not be ignored by the analyst or intelligence staff, especially in view of the difficulties that may attend high-quality, conventional photographic reconnaissance.

During peacetime or prehostilities planning, it is obvious that determination of the timing of enemy attacks and our resulting counterattacks can be made only by assumption or conjecture. Thus the impossibility of determining, in advance of hostilities, when or if post-strike reconnaissance missions will encounter "last-light" or night conditions in the target area becomes one more hazard of using conventional photography. Should either condition exist, conventional photography would have to be deferred until the following day, delaying receipt of valuable intelligence; or be obtained by night photography. The latter adds substantially to the problems of aircraft configuration and logistics and in the present state of the art reduces quantity and quality of the photography. Since the intelligence data upon which the air commander must base his decisions are only as good as the source material upon which the analyst performs his studies, it is readily apparent that the problem of last-light or night photography is serious. But if day-photography techniques alone are selected by the planner or analyst, a last-light atomic strike would leave the latter without source material and confront the commander with a long delay in securing any aerial intelligence.

Post-strike Photo Reconnaissance

It has been suggested that simplicity of analysis and diversity of uses make conventional photographic reconnaissance preferable. But before the planner adopts this technique exclusively, he should recognize that it involves many complex problems. The quality of conventional aerial photography is in direct proportion to the atmospheric clarity in the target area. Low clouds, smoke, and haze will usually prevent or severely penalize conventional photographic reconnaissance. This hazard will be compounded by smoke and atomic debris if the mission is flown shortly after

an atomic strike. If the air commander awaits favorable weather or the disappearance of blast debris, he may so postpone obtaining aerial intelligence that the data will be of little value in his critical decisions on second-phase attacks. Furthermore, if his reconnaissance missions are delayed until dark by the timing of the atomic attack, he will be limited to using reconnaissance aircraft capable of carrying high-intensity, photo-flash equipment or to using entirely different techniques, involving microwave photography or radiation analysis.

In addition to the problems of technique and timing, the air commander must provide an organizational concept that allows maximum flexibility to his reconnaissance and that coordinates the reconnaissance flights with the atomic strikes. It seems essential that the senior air commander deploy elements of his reconnaissance, or at least control of them, to the same levels to which he has delegated authority to launch atomic strikes. This may mean the dispersal of his reconnaissance in small packages to at least as many airfields as he expects to use for the launching of his atomic counteroffensive.

Without this dispersal and without a communications network guaranteeing the same degree of direct control over reconnaissance as over strike forces, the air commander may have difficulty coordinating his strike and reconnaissance elements. If their missions are not correctly and precisely timed, the reconnaissance aircraft could arrive in the target area at the instant of bomb detonation or so soon thereafter that high-intensity radiation might endanger the aircrew or destroy all photographic emulsions through irradiation. Equally serious, the belated diversion of the strike forces to alternate targets without the knowledge of the reconnaissance crews could waste the reconnaissance effort and deprive the air commander of essential intelligence data. Finally, the strike and reconnaissance units must be so coordinated that the latter can be informed quickly and continuously of the target weather data known to the atomic-strike commander, of his selection of secondary targets, and of the all-important last-minute "go or no go" decision for the attack mission.

Related to the problems of reconnaissance organization and deployment is the problem of mission recovery and processing of raw intelligence data. Except for information transmitted directly by electronics from the target area, raw intelligence is of no value until converted into a form usable by the air commander. Planning must include provisions for recovery air bases, decontaminating of aircraft, processing photographic negatives, photo-

interpreting, and transmitting the essential intelligence to the air commander and his staff. Although different techniques would be used for microwave photography, radiation data, or voice recording, the planner would face the same problems in receiving and processing the raw intelligence into usable form.

Some alternatives would be available to the planner, but for now conventional plans for recovering film would probably be selected. For example, because of the complexity of air-dropping the exposed film into the home base or headquarters area, it is more probable that recovery air bases would be provided. Although superficially unimaginative, this solution resolves at once the technical problems of "canning" film while in flight and of parachuting heavy and expensive film magazines. Reconnaissance aircraft must be recovered at some air base anyway. Wet-negative scanning would normally be adequate for the initial photo-interpretation reports, so there would be no equipment problem and little extra cost in deploying duplicate processing laboratories to a number of alternate recovery bases. With a reliable communications net this conventional scheme for mission recovery should meet most requirements of the theater air commander for bomb-damage assessment.

Detection of New Targets

Early-phase reconnaissance is needed to assess bomb damage and to detect new targets. The latter requirement raises many problems not inherent in the reconnaissance of known targets. Although the reconnaissance pilot en route to his primary target may visually detect and photograph obvious new targets, it would not always be possible to correlate these targets accurately enough with geographic location or map coordinates to permit the directing of second-phase strikes against them.

On the other hand rarely would there be time or reconnaissance resources to permit conventional "basic cover" or mosaic photography. Furthermore conventional photography would face the possibility of weather obscuration, which might force the reconnaissance commander to settle for whatever targets of opportunity turned up or restrict his search missions to areas with a high probability of clear weather.

If the air commander selects radar-photo techniques alone, the present state of their development would mean even greater difficulty in correlating intelligence with the exact map-grid location of the potential targets. In some aircraft the navigator's log or flight trace would yield this information, but the fighter-type

reconnaissance aircraft is without a navigator or any system for a continuous recording of mission track and profile. After such a general search mission the analyst would face a formidable task. He would have to correlate radarscope data, perhaps photographs of varying scale, and even verbal and recorded pilots' reports to identify potential targets rapidly and verify map-grid location.

On the other hand, apart from new photographic and navigation techniques and equipment, the basic task during early phases of operation could be limited so as to minimize these problems. Since the search for new targets initially would be combined with first-phase strike reconnaissance, flight tracks generally could be identified. By integrating area-type conventional or microwave photographs with detailed data available on potential targets, the analyst would have a reasonable chance of establishing map-grid locations of targets. Finally, although complete reconnaissance coverage of the enemy territory eventually would be needed, the initial search could be limited to the near-in areas that presented the most immediate threat. By further limiting the search areas to those around transportation nets and population centers or to those suggested by agents' reports, the air commander could reduce his first-phase reconnaissance task to feasible proportions.

*The Optimum System**

If military technicians can dream of the ICBM or similar "ultimate" weapons, it is as reasonable for the reconnaissance technician to dream of an intelligence-gathering system which would be just as final and efficient. Even without technological break-through he will find different techniques for systems now available. Unfortunately some elements of aerial reconnaissance that might be considered optimum sharply conflict with other elements. For example intelligence analysts prefer large-scale conventional photography since it provides large, clear detail that makes for fast and accurate analysis. But such photography has the disadvantages of weather interference, altitude limitations, and large-camera requirements with severe built-in penalties in optical design and weight of equipment. Similarly the advantages of low-level, visual reconnaissance and low-altitude photography are offset by penalties in range, in navigational techniques, and in greater risk for the aircraft and crew.

*Discussion of the configuration and performance requirements for reconnaissance aircraft has been omitted from this paper because of classification and because the problems of reconnaissance design are similar to those encountered in the special requirements of interceptors, intruders, etc.

Despite the inherent superior quality of conventional photography, radarscope or microwave techniques are the most promising for primary, all-weather reconnaissance, especially if coupled with electronic transmission of the intelligence data directly to the analyst and air commander. This combination would provide a system operable under any weather conditions and able to relay intelligence without the time loss involved in the aircraft's return to a recovery air base and the film's processing and analysis. The all-electronic system poses problems of complexity and weight, but they are not insurmountable. With microwave photography as the primary system a relatively light-weight, visual photographic system could be developed. Then reconnaissance would have this proved technique under all-weather conditions. The combined system would eliminate the present barriers for missions flown in uncertain weather or at night, while retaining a capability for detailed analysis.

Since conventional photography ought to continue as a secondary element in the reconnaissance system, certain improvements in cameras and optical design should be considered. Present aerial cameras are usually of large-format design, using film approximately ten inches in width and taking pictures up to eighteen inches in length. This large format yields negatives and prints of generous size and superb quality—ideal for the analyst's purpose. But the size of the camera presents serious weight and installation problems for the aircraft and has serious limitations in optical design, practical lens construction, and aperture. Reducing the negative format to five-inch dimensions, or possibly even smaller, appears to offer many advantages in lens design, in weight reduction, and in simplified installation in the limited airframe space of the jet aircraft. If this change in concept is augmented by camera-mount stabilization and controlled film movement during exposure to provide image-motion compensation, it could produce excellent visual photography to supplement the microwave photography.

As a further aid to visual photography there are opportunities for potential improvement through the use of light spectra beyond the normal visual bands. Extension of the photographic or actinic spectrum into infrared and heat-radiation ranges appears more promising than into the ultraviolet range. Heat radiation analysis adapted to the reconnaissance of industrial areas or urban areas under cold-weather conditions is an especially attractive source of intelligence. To keep visual photography fully versatile, even though in a secondary role, its night capability

must be enhanced by improved cameras or artificial illumination systems. With smaller format cameras, optical-design and aperture improvements alone can yield exposure gains of about four hundred per cent, while improvements in emulsion speed already suggest gains of nearly three hundred per cent. These improvements are clearly essential. But further development of the illumination or actinic power of chemical-type pyrotechnic cartridges and flash bombs seems near an end, unless larger aerial bombs and aircraft are adopted in desperation. Electrical illumination systems, such as xenon-tube excitation and zirconium arc, have long been known and used; but in general they penalize the reconnaissance aircraft severely in terms of weight and altitude and they reveal the position of the aircraft to the enemy. Inasmuch as all visual illumination systems face the same weather problems as day photography, it seems desirable to rely more on microwave systems.

In the past there has been considerable speculation about the use of unmanned missiles for reconnaissance. But the very nature of most tactical reconnaissance missions seems to rule out the missile. A reconnaissance mission rarely is directed to a single target as a warhead missile would be. Either it is locating and covering a list of targets, or it is searching for, identifying, and photographing targets of opportunity. Especially in the reconnaissance of new targets there is such a high demand for pilot judgment that the piloted aircraft will remain infinitely superior to a missile. Although conventional cameras or radar devices could be easily adapted to missiles such as the Matador, the cost of recovering the missile with its intelligence data intact or of expending the missile after acquiring its data by radio appears prohibitive.

As I have suggested, navigation to a target or search area as well as correlation of the target intelligence with exact map location remains a serious technical problem. The optimum reconnaissance system must include an accurate navigational system such as Shoran or Navarho. Such a system should be made self-plotting or self-recording and simultaneously time-linked to the photographic or microwave data. It would provide a navigational aid to the pilot as well as a ready means for the analyst to correlate target intelligence with exact map locations.

Since timely receipt of usable aerial intelligence by the air commander is essential in the early phases of an atomic war, data processing and transmission are the next critical stages in the reconnaissance system. Ideally the visual image or reconstituted image of the target should be transmitted electrically to the analyst

and air commander. This could be accomplished by direct television techniques or by the combination of microwave target-viewing with transmission by television, as suggested above. Possible adaptions of this concept include electrostatic emulsion cameras and a variety of devices for image transmissions, such as facsimile. Any of these systems could solve the problems of speedy transmission of data and recovery of the reconnaissance aircraft after the mission. Because of the many concurrent advantages this concept of electronic-data transmission seems more promising than any of the systems involving air-landing or air-dropping of the intelligence data or exposed films to a ground laboratory.

It appears unlikely that any of these concepts would eliminate the need for some type of intelligence-data analysis. In rare cases high-quality visual photography could be used directly by the air commander. But photographs or data recordings from most reconnaissance missions would have to be screened by competent analysts to sift out usable and vital intelligence. Despite the trend toward mechanical or electronic computing devices, there appears little chance that they will completely replace human observation or analysis of intelligence data. The judgment of a trained analyst will continue to be the best and quickest means of converting raw aerial intelligence data into the presentation needed by the air commander. Only in certain specialized fields, such as electronic propagation, atomic-blast radiation, over-pressure patterns, and population estimations, would it seem desirable to develop or adapt special electronic computing machines to supplant the human analyst. The analyst will retain the main task of appraising the effect of primary attacks and the potential threat of new targets discovered by the reconnaissance forces.

What Now?

Fortunately the reconnaissance commander has little difficulty in selling his product, especially under actual or potential combat conditions. Ever since Professor Thaddeus Lowe proved the usefulness of static balloons for military observation in the opening days of the Civil War, aerial reconnaissance has been saturated with demands well beyond the resources usually available.

On the other hand since the reconnaissance mission in peacetime reverts to training and aerial photography for mapping and recording purposes, there is a tendency to lose sight of the organizational and deployment coordination necessary between the

strike units and the reconnaissance force. If through preoccupation with the more spectacular strike and air defense missions, air commanders permit their reconnaissance force only a self-training role in peacetime, they may find in combat that the reconnaissance force has technical and tactical competence but is insufficiently integrated with strike missions to furnish timely aerial intelligence. This coordination must be accomplished during peacetime training.

Despite great strides in the development and production of new reconnaissance aircraft and equipment, many of the systems desired are not yet available. This means that until the very eve of battle the air commander cannot be certain of receiving the aerial intelligence that he will demand after his first strikes against enemy targets. At present there are serious problems in guaranteeing good, early reconnaissance of targets that are hit at last-light or under poor weather conditions. Consequently preplanning must be most thorough and imaginative so as to require at the outset of combat all useful intelligence, including strike-crew reports and radiation recordings, as well as any data produced by the post-strike reconnaissance force. Even if some of these prove incomplete, collectively they may contain enough intelligence to allow appraisal of strike-mission results.

It is equally important that imaginative planning and resourcefulness continue to be invested in the development of new reconnaissance systems to solve the two critical problems of weather interference and rapid, electronic-data transmission. Until these technical problems are solved the tactical reconnaissance mission can be advanced by imaginative and practical planning, by continuous search for technical improvements, and by the demand that its role be matched to the mission of the strike forces.

67th Tactical Reconnaissance Wing

The Large-Unit Staff

Lt. Col. Floyd Traynham, Jr., USAFR

NO ONE can deny the phenomenal growth in Air Force technology and the concomitant pace of operational thinking during the years since World War II. This growth has placed an ever-increasing responsibility on the commander. He must stay informed enough to make decisions on a variety of subjects that would stagger his predecessor of the piston-engine era. One important way to relieve the commander of some of his managerial burden is to keep alert to ways of tailoring his command to the requirements of his mission and of making his staffs ever more useful. The commander should remember that the maxim that nothing mortal is perfect does not exclude a headquarters, no matter how high in the chain-of-command clouds it may be.

With this in mind the following is a personal attempt to trace the chief patterns of organizational structures. It also points out some of the problems that a commander faces in setting up the organization of a large-unit staff if he wants to keep it both streamlined and useful.

Any military organization starts with a number of soldiers and a commander. As this organization grows larger the job of the commander, making decisions and establishing policies, becomes more and more difficult. As a solution to this the commander divides the soldiers into groups and appoints subordinate commanders responsible to him for controlling their groups. This type of organization relieves the commander from making many decisions he formerly had to make. Now the routine decisions can be made by his subordinate commanders and only important matters need be referred to him. This process may be extended, and the result is commonly called the line organization.

As the command increases in size and complexity this solution no longer satisfies the commander's needs and he is again

faced with an impossible number of decisions. He is forced to appoint advisers in specialized areas. These advisers study the problems that arise and present solutions to the commander for his acceptance. This simplifies the commander's decision-making process. The research is done for him, his reflective thinking can focus on the core of the problem, and many decisions are reduced to a yes or no. This is the line-staff organization in its purest state.

As his command grows even larger the next step the commander can take to relieve himself of the constantly increasing details of his job is to delegate authority to his advisers. This occurs gradually as the commander and his staff work together and he develops more knowledge of their capabilities. As the organization continues to grow the commander must delegate more and more of the authority to act to his advisers, until they in turn act more in the capacity of commanders than planners. Subordinates are now complying with decisions made by several people rather than just the next higher commander. The line-staff organization has developed into a line-functional organization.

As the organization expands, the operating duties of the former planners become so time-consuming that they no longer have the time needed to plan, and their own subordinate staffs become so large that it is increasingly difficult to coordinate whatever planning is done. This problem seems to become acute at about numbered-air-force level.

This problem is a basic one that large-unit commanders have faced for hundreds of years—how to control an organization that is supposed to be an extension of the commander's mind when the organization has grown so large that he can no longer keep track of all its activities. The French solved this by the creation at division or higher levels of a small planning and coordinating group that the commander could control through a chief and could use to guide the activities of the much larger operating staff. The British solved it differently by dividing the staff at division or higher level into an operations group and an administrative and logistical group, each with a chief reporting to the commander. The British solution was based on a study of the German general staff system but eliminated certain of its weaknesses, such as the existence of a morale-destroying elite general staff corps, the possibility of a feud between a commander and his semi-independent chief of staff, and others.

The United States in 1903 adopted a solution similar to that of the Germans by creating a War Department General Staff. This underwent many changes and was finally changed to con-

form to the French pattern in 1920. Finally the Army Air Forces adopted a semi-British pattern in 1942, and the United States Air Force has retained this to the present day. Called the multiple-directorate staff, it is basically the line-functional pattern.

The rest of this article will discuss some of the questions important in organizing and controlling large headquarters. A clear identification of these problems and a recognition of their importance are essential to efficient command, and failure to solve these and similar problems can impair the operations of the Air Force. The relatively undisturbed existence of a headquarters in peacetime is no indication that it cannot collapse under wartime pressure. A weakness may be undisclosed until it is fatal.

This brings us to the first and probably the most important organizational problem that the large-unit commander must solve—how to position his planners. Since the most important function of any staff is planning, how can this best be done?

The line-functional staff may be the best answer. The planners are subordinate to the operators, and their plans are under constant scrutiny to ensure that they are practical. Thus the individuals who must execute the plans can make sure that the plans fit their needs. Because the number of staff officers reporting to the commander is small, the always difficult problem of span of control is partially solved. Fresh information is easily available to the planners. Communication between planner and operator is direct since both are part of the same staff division.

Although these are important advantages, there are also disadvantages. Because of the separation of the various planning sections coordinated planning is difficult. It may be a temptation to give a job that must be done immediately to a planner whose regular planning work is projected years ahead, but this can result in hasty, incomplete planning. Similarly it is easy to transfer personnel from the planning section to an operating section to help solve immediate problems, but again at the expense of proper planning. Communication channels may make it inconvenient to obtain information from other staff planning sections. If the long-range view and the short-range view are not the same, the operator—who is also chief of planning—will tend to favor the one that will put out the immediate fire. The planner is not only far removed organizationally from the commander for whom he is planning, but he is also subordinate to the operator.

A further solution is to have the planners all assigned to one staff group. This may be done in two ways: (1) organize a planning division of the staff at the same level as the operating divi-

sions, (2) have a planning *and* coordinating division at an intermediate level between the operating divisions and the commander. Both of these solutions have been tried by the Army and the Air Force. Since both services have discarded the first solution, let us examine the advantages and disadvantages of the second. Here the weak points of the line-functional staff are reversed to become the strong points. All planning is done by one staff group and can easily be thoroughly coordinated. The planners have time to study, to reflect, and to produce complete, carefully considered plans. The planners have few operational duties to interfere with their planning and can devote their full resources to it. Communication and coordination with all planning sections is easy, since they are within the same staff division. With the planning staff closely related to the commander it can easily obtain any information needed from the operating staff divisions. The commander is assured that plans have received full and fair consideration and that the plan yielding the best final result has been recommended regardless of short-range disadvantages. The planner is close to the commander and learns to function as a real extension of the commander's mind.

Although the system I am describing here is one of many, I feel that its further advantages deserve note. The planning staff, performing its coordinating function, can ensure that the daily activities of the operating staff divisions conform to the long-range plans adopted by the commander. Coordination ensures that the operating staff divisions have all the available information to perform their duties properly and intelligently. Such an arrangement should eliminate much minor bickering among the staff members. The planning and coordinating staff division, being small, assures rapid and efficient coordination of staff activities.

The disadvantages of this organization are more apparent than real. The most often quoted disadvantage is that the planners are in an "ivory tower" and disassociated from reality. This is not valid. Adequate planning involves full knowledge of operating techniques and close coordination with operating staff divisions. The inadequate planner is quickly recognized and out of a job. Another disadvantage often cited is the development of an elite corps within the officer corps. If this is really a hazard it can be avoided by proper rotation of officers between planning and other duties. The American temperament will prevent the creation of an elite corps, in the unpleasant sense of the word, far better than any regulation.

Because this pattern of organization cannot function well unless all of its members clearly understand the extent and limitations of their duties, let us define these clearly.

The commander

- establishes policies and makes decisions promptly
- makes clear the goals at which he aims
- establishes the broad limits within which his staff has freedom to plan and operate
- accepts accountability to his commander for the activities of his command
- develops high morale within his command by personal example and loyalty to his subordinates
- delegates to his subordinate commanders all possible authority and delegates to his staff as much as possible of what is left.

The operating staff officer

- acts as a deputy to the commander in his own field
- keeps the commander fully informed of his activities
- carries out fully and loyally the plans of the commander
- makes decisions and establishes policies in his own field that conform to the commander's over-all plans and policies
- coordinates his actions with all other staff divisions
- delegates all possible authority to his subordinates
- avoids encroaching on the prerogatives of lower unit commanders
- requires only the necessary minimum of information from subordinate commands.

The planning staff officer

- acts as an extension of the commander's eyes, ears, voice, and mind
- develops fully considered, long-range plans for the commander's approval
- develops short-range plans to carry out the long-range plans
- observes all activities of the command and considers these in his planning
- keeps the commander informed of his observations and activities
- advises, but does not direct, subordinate commanders regarding his commander's plans, policies, and decisions
- follows up the execution of adopted plans and advises the commander of further required action.

These job descriptions bring up another question that may as well be resolved right now. Staff officers *do* have authority—

exactly the same kind and from the same source that commanders get it. All military authority is delegated authority from the Congress and the Commander in Chief. They in turn have delegated it to the military commanders, who have delegated it down the line of command until eventually the unit commander delegates it to his staff officers. If there is any question about this, read Articles I and II of the Constitution and section 208 (b) of the National Security Act of 1947, and then trace the command line in all Air Force regulations.

Note too that a commander's authority is not absolute. He is limited in his jurisdiction just as is the staff officer but to a much less degree. For example, he cannot overrule the recommendation of his judge advocate on approval or disapproval of a court-martial. He must appeal to the appropriate higher command for a decision, just as his staff officers when their authority conflicts must appeal to him for a decision.

THE commander faces other problems besides the positioning of his planners in the organization of his staff. Should he appoint a chief of staff to control the internal operations of the staff or should his staff report to him directly? Should there be a special briefing section for the commander or should this be done by the principal staff divisions? Should staff officers be required to rotate between staff and field duty or should they remain on the staff permanently? Should staff officers be required to prove themselves in the field as commanders, or is effectiveness in the field really a gauge of staff effectiveness? How should the commander obtain homogeneity in his staff divisions? Does he need a personal staff beyond his aides and of what should it consist? What operations can he eliminate and delegate to subordinate commanders? From how much routine administration can he withdraw by authorizing his subordinate commanders to deal directly with the headquarters of final decision?

These questions will be taken up in the order I have listed them. But before discussing them here are some common definitions that will hold for the rest of this article. They are not unusual, but for clarity's sake they need to be stated.

- *commander*—an officer who has the authority and power to make decisions, establish policies, and have them carried out.
- *vice commander*—an officer who has the full authority and power of the commander in all areas.

- *deputy*—an officer who has the full authority and power of his chief in a specialized area, such as personnel.
- *assistant*—an officer who is a planner, adviser, and coordinator but does not have the authority of his chief. For example, the assistant deputy commander for personnel would be an adviser and coordinator only for the deputy commander for personnel, who, in turn, would have full authority to make decisions and establish personnel policies without reference to the commander himself but within the broad limits previously established by him.

Now to get back to the questions. The first one deals with the chief of staff. Here I do not mean the Chief of Staff, USAF, whose function is more that of a commander than that of a chief of staff. In fact the title of the military head of the U.S. Army was Commanding General until 1903, when Elihu Root had it changed to make absolutely clear that the head of the Army was subordinate to the Secretary of War and an assistant to the Commander in Chief. The situation of a chief of staff calls for special comment. The title itself implies several things: first, that his duty is to guide and coordinate the activities of the staff; second, that he is in the staff group, not the command group, and in dealing with subordinate commanders should aid in but not usurp the commander's prerogative to order. This was the function of the position when it was originally created in the French Army. In the line-functional staff organization used throughout the USAF there are further complications if it is used. As I pointed out, the operating staff heads are in reality deputy commanders, not purely planners and advisers. A chief of staff is in a most anomalous position; being subordinate to the command group he can hardly guide and coordinate the activities of his superiors with authority. This is a proper function of the vice commander. If the staff is organized with a planning and coordinating group interposed between the commander and the operating division, the problem is still more awkward. The planning and coordinating group must have a head, but his function is even more that of a staff coordinator and director, not a commander. In this case it is perhaps better to avoid the title "chief of staff" altogether and create some other title, such as chief planning coordinator. All in all it would appear that the position of chief of staff, as it presently exists, is an anachronism that could well be eliminated.

The next question: should there be a special briefing section? The presence of such a section offers advantages. Experts in condensing voluminous material are grouped together and work for the best interest of the command. They can both save that

invaluable commodity, time, and can identify any cloudy thinking so that it can be cleared up. Their files are valuable for historical information. They ensure that the commander is fully informed. But there is one great danger in such a section. It would probably be composed of relatively junior officers. These officers might not grasp all the implications of the original material with which they deal, or their own ideas and prejudices might unintentionally bias their briefs. This would mean that the commander would fail to get the full picture, in which case the briefing section becomes a liability rather than an asset.

The question of staff personnel alternating between staff and field duty and the question of staff officers being required to prove themselves in the field are tied closely together. Although the final decision is probably a matter of opinion, the present concensus seems to be that it is desirable for the staff officer to have considerable field experience and to have proved himself as a commander. I personally tend to disagree with this opinion. For one thing, people can frequently be classified into thinkers or doers. Because an individual who is one is frequently not the other, the requirement that staff personnel prove themselves in both ways could disqualify many potentially valuable staff officers. For another, the mental qualities of the thinker should enable him to learn and anticipate the problems of a commander intuitively and thus rapidly. For this quality experience in the field would be of negligible value. Finally, there have been great staff officers in the past with relatively little command experience—Jomini, Berthier, Von Steuben, Marshall. All this leads me to suspect that there are officers who would be excellent staff officers for their entire career but who are not fully used as such or who, stigmatized by a failure as a commander, are barred from important staff positions. The question of permanent staff duty raises another point. The existence of permanent staff officers is probably a sound concept, but they must be rotated periodically from one headquarters to another in geographically different places. Extensive tenure can be extremely dangerous to efficient staff functioning.

Homogeneity of staff divisions is a problem that seems simple on the surface, but trying to determine what type of homogeneity should be adopted becomes more complicated. There is a mission type of homogeneity in which all activities resulting in a completed action are grouped. With this type under such a heading as bombardment one could group the procurement of personnel and aircraft, the training of crews, the activation and training of

organizations, the assigning of missions, the analysis of results, and the planning of future missions—all under one chief. He would have all the information about and the control of bombardment. Another type of homogeneity lies in a functional grouping. Here all activities connected with personnel are grouped together. Recruiting, training, classification, assignments, separations, and promotions all come under one chief. Another problem in homogeneity is the number of staff functions that can be grouped under one head without sacrificing his understanding and control of their activities. For example, the Deputy Chief of Staff, Operations, Headquarters USAF, deals with operations, planning, atomic energy, organization, manpower, biological warfare, chemical warfare, communications, and mobilization planning. How much can a man supervise? Each of these fields is a career in itself. Conversely it would be an unwieldly staff that featured a staff section for each of these duties. New staff sections should be created only after all other methods of accomplishing the duty have been found unsatisfactory.

The next question: what personal staff should a commander have? This staff can be divided into two sections: those responsible for his personal well-being and those performing official duties closely related to his command duties. About the first group there can be little question; when the lives of many men may depend on the quality and efficiency of one man's thoughts, everything possible must be done to ensure that he works at highest efficiency. The loss in man-hours of a few people assigned to serve the commander in his personal affairs is insignificant compared with the possible number of deaths that might occur if, for example, the quality of his mattress interfered with his mental efficiency.

The personal staff may also consist of any or all of the following: judge advocate, chaplain, inspector, personal affairs officer, information services officer, adjutant general, surgeon, protocol officer, reserve affairs officer, and others. All these functions are really administrative, and in a well-organized staff could be made accountable to the principal staff officers in charge of administration. Possibly the inspector is an exception and should be accountable directly to the commander since many of his inspection activities involve highly confidential matters, or matters, such as the integrity of his officers, that are for the commander's ears alone. Making the remainder accountable to a senior staff officer conforms to those principles of span of control and delegation of authority that seek to limit the number of individuals reporting directly to the commander, thereby allowing him time and energy

for his primary job of making decisions and policies for the entire command.

The final question deals with the commander's efforts to simplify administration. Since the sole purpose of administration is to aid operations, not block them, he must make every effort to see that it does not interfere with them. The best way of simplifying administration is to eliminate it. Increasingly it is becoming obvious that, when the intermediate headquarters have no real interest or decisive power in the action, as many administrative actions as possible should be allowed to proceed directly from the office of origin to the headquarters of final decision. It might also be desirable to limit in the chain of command the number of headquarters that function as administrative headquarters. Then administrative actions could be routed from, say, squadron to wing to major command to USAF. This not only would avoid much useless administrative delay but would increase the efficiency of those headquarters eliminated from the administrative chain. They would be free to concentrate on operations—the core of the Air Force's mission.

THE above survey of problems in the organization of a commander's staff is not meant to be definitive. There are many other structures for the staff sections in a large headquarters. If the reader will keep his eye open to all opportunities to iron out the snags that cannot help but come up in a large unit, he can do much to make the lot of his commander easier. Although perfection may be elusive, it should not be abandoned as a goal toward which to work.

Albuquerque, New Mexico

USAF commanders analyze . . .

U. S. Air Power Today

A Quarterly Review Report

. . . its capability and its needs

IN THE late spring of 1956 a committee of five U.S. Senators undertook a review of American air power. For 14 weeks the witnesses came and went, uniformed professionals from the high command and staff positions of the United States Air Force, the Secretary of Defense and the Secretary of the Air Force, the Chairman of the Joint Chiefs, and, as the inquiry broadened to the auxiliary air arms of the other services, certain generals and admirals and ranking appointed officials of the Army and the Navy.

The stated purpose of this Subcommittee of the Armed Forces Committee of the United States Senate, under the chairmanship of the Honorable Stuart P. Symington of Missouri, was to "determine whether the present and planned strengths of the United States Air Force are adequate to preserve the peace through deterrence to aggression." After the prepared charts had been displayed and the prepared briefings spoken, the Committee posed its questions, hundreds of questions, seeking out the strengths and the weaknesses, the capabilities and the needs of the air forces represented by the galaxy of USAF rank filing through the witness chair.

Much that the witnesses had to say belongs of necessity to a top order of secrecy. The rest was published verbatim, 1863 pages of it, under title of the Committee Hearings, more than enough to acquaint the professional with the considered opinions of his own leaders on the striking power and resources of the Air Force to which he belongs. A systematic reading of these 1863 pages reveals certain fundamental conclusions upon which the USAF commanders were in general accord.

Early in the proceedings testimony by General Curtis E. LeMay, Commander in Chief, Strategic Air Command, set a pattern of thought around which much of the rest of the hearings revolved.

Striking Power Is the Best Defense

Mr. Hamilton [the Committee Counsel]: "General LeMay, what is the principal responsibility of SAC?"

General LeMay: "The mission of the Strategic Air Command is to train and maintain an effective and secure nuclear air offensive force to conduct strategic air warfare. The objective of this mission is to become and remain sufficiently strong to deter aggression during a cold war and, in cooperation with other United States and allied forces, to win the decisive air power battle in a general war should it occur."

Mr. Hamilton: "General, what are your views as to the best defense against a strategic atomic air attack?"

General LeMay: "Total defense is secured through two functions: First through active and passive defense; and second, the offensive strike capability. All responsible airmen agree that it is impossible to provide an airtight defense against a well-coordinated and properly executed atomic bombing attack.

"Attrition will vary, depending upon the relative capabilities of offense versus defense, but a substantial part of the offensive force will always get through the defenses. Therefore, the primary defensive force becomes the offensive atomic strike capability of sufficient effectiveness to provide a deterrent force.

"A deterrent force is an effective nuclear offensive force which is secure from destruction by the enemy regardless of what offensive and defensive action he takes against it. The striking force is considered effective if it can still inflict unacceptable damage on the enemy."

Mr. Hamilton: "Thank you, General. I would like now to ask you the fourth question: If two countries have the same relative scientific and military air power, such as the United States and the U.S.S.R., is it in your opinion possible for one country to have purely defensive forces and measures adequate to effectively stop a strategic atomic air attack by the other country?"

General LeMay: "I think that I have just answered that question by saying that it is the opinion of all responsible airmen, and the experience

The Subcommittee on the Air Force of the Committee on Armed Services, United States Senate, was appointed by the Committee Chairman, Senator Richard B. Russell, "to examine into the condition and progress of the Department of the Air Force and ascertain if present policies, legislative authority, and appropriations are adequate to maintain a force capable of carrying out its assigned mission." Under the chairmanship of Senator Stuart Symington, its membership included Senators Henry M. Jackson, Sam J. Ervin, Jr., Leverett Saltonstall, and James H. Duff. Chairman Symington indicated that the Subcommittee would primarily inquire into the capability of the United States Air Force, especially its capability to deter aggression. From the voluminous responding testimony the *Quarterly Review* has digested significant views concerning the striking power of the USAF stated by its own uniformed commanders on the witness stand. The result is offered as a report of current key USAF professional opinion, as publicly expressed, on mission capability.

of all nations in wartime, that a purely defensive force cannot effectively prevent a substantial portion of a properly coordinated and appropriately executed bombing attack from getting through."

. . . SAC offensive capability

Mr. Hamilton: "General, against what must SAC's required combat effectiveness be measured?"

General LeMay: "Strategic Air Command has a double role under present national policy. First and foremost, it must possess sufficient strength and readiness to deter open aggression against the United States and its allies. Second, in the event such aggression does occur, SAC must be capable of immediate and decisive attacks against the enemy's warmaking capability.

"All modern military men, whether they be airmen, soldiers, or sailors, agree that no surface military tasks can be undertaken until air superiority is achieved. Therefore, the first thing that must be done in modern war is to win the air power battle. Our required combat effectiveness must therefore be measured against this task."

Mr. Hamilton: "Now the next question, please, General: Does SAC now have combat effectiveness sufficient to enable it to discharge its principal responsibility, that is, at the present time?"

General LeMay: "Yes; at the present time, and in spite of recent Soviet gains in aircraft and weapons technology and production, it is considered that SAC continues to maintain sufficient advantage over the Soviet offensive capability to enable accomplishment of its primary roles. We must recognize, however, that a new factor has entered the equation, and that is that the Soviet Union has a long-range attack capability that it did not have 5 years ago.

"This factor creates the possibility of an initial surprise attack upon SAC, which in turn would reduce its deterrent power and retaliatory capability.

"However, under any reasonable set of assumptions we believe we now have the capability of winning any war the Soviets might start. We are not capable of winning it without this country receiving very serious damage. Five years ago we could have won the war without the country receiving comparatively serious damage."

Two premises were reiterated by all the Air Force spokesmen and commanders: the decisiveness of air power, and the possession by the enemy of the initiative and the advantage of surprise at the outset of war. These two assumptions must be weighed heavily in any discussion of the composition both of the Air Force and of the other services as well. The first, that air power is decisive, which has been subjected to much fuzzy thinking, was reduced by Major General McConnell, Director of Plans, Strategic Air Command, to its simplest terms: "It does not mean necessarily that the war is over the minute the air power battle has been won. It does mean that when the air power battle has been won and you are free to roam the skies of the enemy, the decisive phase has been concluded." Once this phase is over, what remains of the defeated forces will be powerless to alter the outcome of the conflict.

The true capability of an air force relative to that of a potential enemy is a tremendously complex equation involving a multitude of factors in addition to the number and quality of aircraft available. Many of these factors stem from the premise that the timing and the nature of the initial attack will be determined by the enemy. Under this premise certainly one assumption with regard to the United States is that the enemy will strive to achieve maximum surprise, with the primary objective of destroying the retaliatory potential of the Strategic Air Command.

Soviet Gains Swell USAF Requirements

Against this background the Committee sought to probe into the effects on the Air Force's capability of what General LeMay had termed the "Soviet gains in aircraft and weapons technology and production." Testimony was introduced that the Soviets have vehicles for weapon delivery that are rapidly becoming comparable to SAC's. In production and in operational units are two long-range heavy intercontinental bombers, the Bison and the Bear. The Bison is powered with four jet engines and roughly compares to the B-52 in performance. The Bear is a turbo-prop heavy bomber of greater range and speed than the B-36, although similar in altitude capability. As to numbers, a Strategic Air Command chart was displayed to show "the production figures of the Bison and the Bear as against the B-52 on a 20 per month production base, and 17 per month production base."

Senator Symington: "On this chart am I to understand from this that on the basis of the present plans and programs of the United States, the total number of intercontinental bombers by July 1, 1959, will be less than the estimate of total Soviet production of the Bisons and Bears, even after a step-up to 20 per month? . . . so that the total, if we stay at 17 a month peak, if we hit it and stay at it, based on present programming, the Communist intercontinental bomber strength will be just a little over double the strength of the United States; is that correct?"

General McConnell: "That is correct."

That a growing Soviet capability increases SAC requirements in quantity as well as in quality of its aircraft was emphasized throughout the hearing.

Mr. Hamilton: "Is it not a fact under our national policy of peace and nonaggression, we must have an Air Force adequate to meet a surprise attack?"

General LeMay: "Yes."

Mr. Hamilton: "Does this not mean that we should have a long-range air force that, from the standpoint of striking power of its aircraft, is considerably stronger than that of the Russians?"

General LeMay: "If we suffer a surprise attack, it is reasonable to assume that we will suffer losses to our force. The remainder should be strong enough to inflict damage on the enemy that will be unacceptable to him if we are going to succeed in deterring an attack in the first place. It is then reasonable to assume that the original force without losses should certainly be initially stronger than the Soviet force."

Continuous Modernization Is Urgent

Consideration of the magnitude desirable for forces in-being pointed up the radical change that has become possible in the pace of a major war since World War II. Technological advances in weapons and in delivery systems in the past decade preclude any possibility of a build-up period after the outbreak of hostilities. Once the air battle has been won, the surviving strategic force would deny time for reequipment, even if the industrial facilities remained intact after the original attack. The Air Force commanders stressed acceleration of modernization in all branches of the air establishment, particularly in weapon and delivery systems, bases, and skilled personnel.

. . . aircraft

The three combat commanders all indicated areas of deficiency in weapon and delivery systems. General Earle E. Partridge, Commander in Chief, Air Defense Command and Continental Air Defense Command, underscored the requirement for better altitude capability in his interceptors. General O. P. Weyland, Commander, Tactical Air Command, testified to the requirement for a supersonic tactical bomber and for jet tankers and airlift to increase TAC's mobility. In view of the increase in Russian strategic air power, General LeMay was asked if there should be an increase in the number of B-52's presently planned for SAC. His answer:

"Yes, I believe that we should maintain the deterrent position that we have had over the past 10 years. I think this means an increase in the planned number of B-52's. Our force should be equipped with modern equipment, in sufficient quantity, at a rate that can be produced by our industry and absorbed by our units, and supported by our base structure, without unacceptable dislocation of industry and the national economy."

The range and altitude performance of jet bombers has also generated a requirement for jet tankers. "We could increase our intercontinental strike capability considerably from our planned base structure and with the same size of bomber force if we had more [jet] tankers than we are now programmed to have." Stressing the importance of the jet tanker, General LeMay added: "The slower conventional tanker, in order to make proper contact with its bomber, must depart up to several hours before the bomber. The bomber, forced to wait on the ground, is then exposed to enemy attack. The airplanes we are now refueling are jet airplanes. A jet tanker has the same general performance characteristics as the bomber and, therefore, can accompany the bomber, eliminating the rendezvous problems. In addition, the performance of the jet tankers is such that the refueling altitude is at a height above most of the weather, eliminating weather problems, and adds to range because the bomber does not have to descend to piston-engine altitudes to receive its load of fuel."

With regard to the aircraft industry's capability to increase production rates of various aircraft already on the assembly lines, Lt. General C. S. Irvine, Deputy Chief of Staff, Materiel, Headquarters USAF, gave his opinion that, if necessary, the production rates could be considerably increased:

B-52's from a planned 20 to 46 per month, KC-135 jet tankers from 20 to 35 per month, and five times the present F-104's. Limitations are in production costs and, in the case of the F-104, lack of experience with the aircraft.

Despite the requirement for modernization of equipment, the Air Force has all along recognized that more is involved than just numbers of airplanes. Other factors combined to lessen the over-all power position of USAF as against the Soviet Air Force. Testimony of the combat commanders and other USAF representatives was to the effect that the component parts of the air program had received unequal attention and in some phases required priority immediate action to prevent further retrogression. Post-World War II cutbacks in the armed forces and military budgets supply part of the reason. From 1945 to 1950 the lag in development of aircraft was more than matched by a deterioration in other vital areas, especially bases and personnel. It was brought out that as early as spring of 1953, General Vandenberg, late Chief of Staff, USAF, testified before a subcommittee of the House Appropriations Committee that the numbers of aircraft provided in the 1954 fiscal budget were immaterial, since personnel and bases were insufficient.

That bases and personnel remain priority problems today was underlined by General Earle E. Partridge:

Senator Saltonstall: "Then you did not mention heavier production of planes. Would you put that in at the end of those others [problems]?"

General Partridge: "In my case, the production of planes — you are speaking now of numbers of planes—takes on an aspect of lesser importance than the others. My immediate and most pressing problem is to bring the establishment which is already in being, or programmed, up to the peak of effectiveness, and to get it set so we will be prepared to ward off an attack, should it be started."

Senator Saltonstall: "Of those, you put people first, bases second, and maintenance and operations third. Is that correct?"

General Partridge: "That is about right. R. and D., and finally, additional numbers of aircraft."

General LeMay and General Weyland substantiated this priority of problems. General Weyland stated he could not at present use any more of the 100-series fighters because he lacks skilled technicians to maintain them. In some explanation of the personnel and base deficiencies General Irvine said: "Senator Symington, I think it has always been true that the airplane, the hardware, has always been the dramatic thing, the thing that is easy to defend because you are talking about tangible things and large packages that you can look at.

"It is always most difficult to defend the fact that the sergeant ought to have a commissary or a post exchange to go to, and he ought to have a decent place to live. Those are hard things, because you are talking about a lot of individual people.

"On the matter of bases, sure you could operate B-52's off a field as bare as the top of this table, but they wouldn't be very good very long, because when they went out of commission you couldn't fix them.

"That is the reason that General Hewitt and General Gerrity* and I,

*Maj. Gen. Albert G. Hewitt, Director of Maintenance Engineering, Hq USAF, and Maj. Gen. Thomas P. Gerrity, Assistant for Production Planning, Hq USAF.

who have spent our lives in this business, we talk about the necessity for the back-up so that the new airplane, when it sets down, isn't just a picture in a frame. It is something that has life and capability to do its job, to do its assigned mission."

. . . personnel

The Committee was told that the most serious factor in the personnel deficiency problem is the inability of the Air Force to make a service career as fully attractive as a career in civilian life. Skilled technicians who have been trained in the many highly specialized fields are leaving the Air Force at the end of their obligated tours. This rapid turnover of hard-core personnel has seriously crippled the Air Force's capability to perform its mission.

This manpower problem revolves not around numbers but around effective manning—having a fully trained man, capable of carrying out the job, for each position. The low percentage of effective manning in technical skills directly affects the combat-readiness of all three combat commands. Illustrative of the results of this situation are the curtailment of flight training in TAC, the shortage of crews in ADC, and the limiting of SAC dispersal plans.

The Air Force and the other services, also hard hit in this area, strive hard to retain their trained personnel. Although the last Congress passed the major requests by the Air Force to increase the attractiveness of the service, much remains to be done. Still to be ironed out and reduced to the form of proposed legislation are requirements in four areas: across-the-board pay structure, dependent housing, educational rights, and the restoration of commissary and base exchange rights. Until a service career is made comparable to similar endeavors in civilian life in the form of security, pay, and the fringe benefits, maintaining a combat-ready and effective Air Force will be difficult, if not impossible.*

. . . bases

Part of the problem of bases stems from the fact that most of the current SAC force of heavy bombers will be launched, in the event of war, from their home or dispersal bases. This, of course, was not the method of World War II, and many bases established in that time were positioned to take advantage of maximum flying weather in the lower portions of the United States. Used for strategic bases, however, they increase the range and refueling problems in an attack against U.S.S.R. targets. As to reconstruction of other World War II bases, Major General Lee B. Washbourne, Assistant Chief of Staff, Installations, USAF, stated: "We found that the reconstruction of World War II bases is not an economy, necessarily; and frequently due to the location, it is better to start off with new ones than it is to spend too much on the older ones. We selected the cream of the crop when we began the build-up in 1950, so there isn't much left to pick from. . . . We can temporarily disperse elements of the Strategic Air Command on a great many bases, both that the Air Force uses now for other purposes and possibly those used by the Navy and even the major civilian airports; but it would have to be a strictly temporary proposition."

*For a more detailed examination of the Air Force personnel problem, as presented to the Committee, see "The Value of the Pro," *Air University Quarterly Review*, Vol. VIII, No. 3 (Summer 1956), pp. 34-45.

Asked how many bases the Air Force is short for the 137-wing program, General Washbourne answered: "I believe the figure of 3 or 4 has been used, and it is approximately correct. In other words, if you say you don't have a base to do a certain job, that is to beg the question, and using something else temporarily, that is what we are mostly doing; so we made up most of our shortages with what we call interim deployment or, in the case of the defense units, maldeployment. They are not where they are scheduled to be when they finally get in place." General Washbourne's figures, however, did not include the SAC proposed dispersal plan.

"The base construction program of the Air Force," General Washbourne testified elsewhere, "is lagging behind its other accomplishments in building the 137-wing force. As of 1 July 1957, the Air Force will have in place at least minimum facilities for operations at strategic, tactical, and air-defense bases. Only a handful of bases, mostly overseas, will not be ready for occupancy on schedule. A number of units will not have moved to their permanent assigned locations, and deficiencies will exist in operational facilities, particularly housing. The necessity for satisfying the base deficiencies, concurrently with the phased implementation of new concepts and weapons, generates the need for substantial construction programs in succeeding years."

The magnitude of the construction program was set forth in General Washbourne's opening remarks to the Committee: "The Air Force is engaged in a construction program to provide base facilities for the 137 wings, the early warning system, and test and operational facilities for new weapon systems, estimated to cost through fiscal year 1958 on the order of $10 billion. The total number of Air Force installations will be approximately doubled, 1600 to 3100. Of this number, 360 are classed as active principal bases, 204 of those in the continental United States and 156 overseas. The construction objective is to provide by end fiscal year 1957 a permanent home station for each of the operating elements of the 137-wing force, and such additional operational, logistic, training, support, and reserve installations as will provide for efficient sustained operations of the force."

Senator Symington: "You mention what it is estimated to cost through fiscal year 1958, but the objective is to provide something by the end of the fiscal year 1957. Is there any discrepancy in that?"

General Washbourne: "No, sir, not really. We will simply not realize all of the items in the 1957 program, and we will have to continue the program on into 1958."

Senator Symington: "In other words, you do not plan now to reach your objective?"

General Washbourne: "It does not look like we will reach it, in terms of the required expenditure."

Air Defense Grows More Difficult

Although the base and personnel situation was recognized by the Air Force, together with the necessity for accelerated modernization of equipment, little remedial budgetary aid came in the early 1950's. Militating against increased appropriations were the costs and nature of the commit-

ments in Korea and, even more significant, a general underestimation of Russian technological and scientific capabilities. The latter affected the planning for a future air war and for equipment to fight it with. The post-war feeling of relative complacency induced by the United States monopoly of the atomic weapon was jarred but not entirely dispersed by the Soviet explosion of an "atomic device" in the fall of 1949. Their delivery vehicle was still believed to be the Bull (TU-4), the U.S.S.R. copy of the obsolescent B-29. The crusher came in May 1955:

Senator Symington: "In your testimony yesterday, General Partridge, . . . you said: 'When we started out to build an air defense system, we started out to build one which would be suitable to combat the TU-4.

" 'We now have a good system to fight the TU-4. Unfortunately, the Russians came along a little more rapidly than we had anticipated in their technical developments, and they introduced a jet bomber and the Bear more rapidly than was forecast. As a result, we find ourselves in the years 1957, 1958, and early 1959 in not too good shape with regard to our high-altitude and our low-altitude air defense.

" 'We are trying to cover the gap in the low altitude with a ground observer corps. We are anxious to bring in the F-102 to help with the high-altitude coverage.'

"Is it a fair statement to say that what you mean by that is that we have an air defense system capable of handling the B-29 type, TU-4, but that we have been, in effect, caught short by the awareness in the last year or two of development in the Russian bombers?"

General Partridge: "Well, we have known about the Badger,* the Bison, and the Bear for a considerable period; just how long I cannot say offhand.

"The Badger we saw first, but it was not until the air show of 1955 that the Russians began to show these larger bombers in numbers. Their rehearsals for the air show in Moscow in May of 1955 really introduced this note of urgency in getting along with the defenses against that type of aircraft. We didn't think they could bring them into production as quickly as they did."

. . . *impact of ICBM*

The sudden realization in 1955 that the Russians were rapidly closing the qualitative gap lent renewed emphasis to the Air Force problems of defense and offense. The Committee sought to determine how "secure and effective" the USAF retaliatory force will be against the threat of long-range heavy bombers, until the optimum defensive posture is realized in the early 1960's. In General Partridge's words of reply, " . . . the defenses which we are equipped with today or which we are planning—which we can see on the horizon—take care of the Soviet threat up through the manned bomber, but the Soviets are said to be building an intercontinental ballistic missile, and we must somehow devise a defense against this type of attack. . . . We are studying the problem. We are making preliminary estimates on what is required in the way of hardware and locations, communications, and anti-missile and so on, but we still do not have a workable solution. . . . In principle we have one according to the scientists, but it has not yet been

*A twin jet medium bomber comparable in performance to the B-47.

translated into any hardware, and until we can prove out the components and figure out a way to make the thing work operationally, I do not rest very easy."

Later in the hearing, this testimony was added:

General Partridge: "New missiles, new fighters are coming into the inventory and we should be able to operate effectively against the Russian Badger, the Bison, and the Bear as well as the Bull as soon as these new weapons are with us."

Mr. Hamilton: "And when would that be, sir?"

General Partridge: "In a few years. Our capability is growing all the time.

"As a matter of doctrine, we believe that the best defense is a good offense, and we believe that our primary mission in the Air Defense Command is to defend the bases from which the Strategic Air Command is going to operate.

"We believe also that we have to provide a reasonable, an equitable protection for the key facilities, the population centers and our industry.

"We believe, however, that our primary objective is to convince the enemy that he should not attack, and if we can deter the enemy from attacking, we have achieved a 100-per cent air defense."*

. . . *passive defense*

As passive defense measures, SAC has concentrated on dispersion, and has already had approval in principle by the Air Council of its alert concept. Dispersal planning is limited by money and personnel:

Senator Saltonstall: "Does the present budget that is submitted to Congress for the 1957 year and contemplating going forward into 1958 and what we start this year, does that budget contain new SAC bases and the extensions to SAC bases that will build up the adequacy of the base system for SAC?"

General LeMay: "No, sir. I would like to have more. Our base program has generally been behind the other programs."

Senator Saltonstall: "That is right."

General LeMay: "Because it seems to be one of the facts of life that money is appropriated for hardware, for airplanes at a much more rapid pace than the support facilities from which to fly them, so that our base program has constantly been behind our planned program for getting the combat units ready."

Senator Saltonstall: ". . . Your airplanes have increased. Your bases have increased one-fourth as much."

General LeMay: "Yes, sir; and that has caused concentration. . . . "

Senator Jackson: " . . . You need every possible field, in the event of an all-out attack, in order to disperse."

General LeMay: "Yes, our base system must be expanded. However, it is a very complicated problem. For instance, the technical qualifications of the people that we have in the Air Force at the present time is low. We

*For a discussion of United States air defense, see "The Emerging Shield," *Air University Quarterly Review*, Vol. VIII, No. 2 (Spring 1956), pp. 49-69.

only have a small number of really well-qualified people. By concentrating them, we can get better utilization of them, so that if by some miracle we had all of the air bases that we might ever dream of wanting, we would be handicapped in how we could spread our force out by that limitation of trained people."

. . . SAC counter-ICBM alert

The impact on SAC of the enemy's future possession of the ICBM is reflected in the alert time. A SAC briefing officer told the Committee: "Immediately that they possess a missile operationally feasible, the threat goes down to something in the order of 15 minutes. At that moment we must have readiness sufficiently available to cope with that 15-minute threat. Now, this lends itself to time phasing, because the 15-minute threat won't materialize tomorrow, so that we can plan our work toward that time. And our ability to launch the force with the desired degree of readiness depends upon our capability to do so through training and practice, and on military construction programs which will give us the bases we need and the configuration we need to launch this force."

To meet the threat of a limited warning time, SAC has proposed an alert concept that has been approved by the Air Council in Headquarters USAF. The scheme of operations was briefed as follows:

"Our aircraft will be fully ready to start engines and taxi. The aircraft would be parked, nose out, in a taxi-out alert type hangar. The design of this hangar is already on paper, not final but on paper, and the people at Wright Field, as well as the people at AIO at SAC are working on it.

"Our aircrews would be in a readyroom adjacent to the aircraft. Their meteorological flight plans would be completed for the time period they are on alert. They would have completed visual inspection of the aircraft and the weapons, and they are wearing partial personal equipment. . . . The alert maintenance crew, the ground crew that maintains the alert aircraft, are living the same type of life as the crew . . . and they are on alert adjacent to the aircraft 24 hours a day. . . .

"Our alert facility consists of the alert hangars I mentioned. The design consists of quick-opening doors, with readyrooms being an integral part of the alert hangar design in cold climates; and this alert hangar and the SAC alert package is located near the take-off end of the runway. We need the most direct taxiways that we can design and build, because aircraft will be taxiing at high speeds, with heavy loads at maximum gross weights and, of course, minimum turns are required for the same purpose; power for aircraft accessories as we need it."

This alert concept in conjunction with SAC dispersal plans supplies the major portion of the effort to combat the enemy's initiative and possible surprise. Testimony was introduced to the effect that there is no complete defense against a well-organized attack by manned bombers. General LeMay estimated that attrition to enemy bombers by our active defenses would be no higher than 25 or 30 per cent. For this reason he stated "the best thing that the Air Defense Command can do for SAC is to provide warning time."

Tactical Air Forces Deter Limited War

Important testimony by General Otto P. Weyland, Commander of Tactical Air Command, pointed up capabilities and requirements for dealing with limited warfare.

General Weyland: "Now on June 25, 1950, the Korean war started and caught us without sufficient combat-ready tactical air forces to fight even a peripheral war.

"As the war progressed, we hastily built up the forces to cope with the situation, the air aspects of which were characteristically and predominantly tactical in nature.

"If we had had adequate tactical air forces in being and the announced intention of using them in such a situation, it is questionable whether the Korean war would have started. It is pretty generally accepted that with the maintenance of a strong strategic air command in being, any armed conflict in the near foreseeable future will in all probability be of the brush-fire or limited type as opposed to an all-out or global war."

Mr. Hamilton: "Pardon me, General, would you mind repeating that?"

General Weyland: "Yes, I would like to repeat that.

"In my view any armed conflict in the near foreseeable future will in all probability be of the brush-fire or limited type, and that for the reason that as long as we maintain a strong strategic Air Force that has the power to deter a major war, that any war in the foreseeable future would be of a limited nature.

"It is obvious to me therefore at least, obvious to me that we must have adequate tactical air forces in being that are capable of serving as a deterrent to the brush-fire type of war just as SAC is the main deterrent to a global war.

"I think it appropriate to point out that in our mutual-security arrangements many of our allies can provide ample manpower for ground forces, but do not have the capability of providing tactical air forces for joint operations.

"It therefore falls to the United States to furnish the tactical airpower to match the ground forces' contribution of our allies in either an all-out or a periphery war."

. . . jet tankers required for mobility

For this reason mobility is stressed in training tactical air forces and planning for their employment. However, TAC faces several severe difficulties in preparation for its combat missions. The most critical, the problem of skilled manpower, is the same one that is plaguing all the combat elements of the Air Force. A second, the inadequacy of housing and off-duty facilities for personnel on TAC bases, is also common to all Air Force units. But it is the lack of adequate tankers that most seriously affects the mobility of combat tactical units. At present the two tankers available are propeller-type KB-29 and KB-50. Each can refuel jet fighters and fighter-bombers only at relatively low levels, which penalizes their performance and does not permit refueling above weather.

Asked why TAC was not getting any KC-135 jet tankers, General Weyland replied: "Well, I think that at this time it is probably fair to say that

the Strategic Air Command has had a higher priority on the tankers. We are the two users of tankers, and the Strategic Air Command has had a higher priority than I have."

The results of the lack of jet tankers were brought out by Colonel Nathan M. Abbott, Director of Requirements, TAC:

Colonel Abbott: "The requirement, the optimum requirement, for the tactical tanker is an airplane that will give 250 knots indicated air speed at 35,000 feet, which puts us both above the weather and gives us the speed to refuel the fighter fully at that altitude.

"These airplanes don't approach that, as you know (KB-29 and KB-50)."

Senator Jackson: "With regard to the capability of your weapon system, which you are servicing through this present tanker system, how much would you be able to extend it with a jet tanker which could refuel at an optimum altitude, which you have indicated, and at an optimum speed, which you have indicated? You need both, do you not?"

Colonel Abbott: "Rangewise, we can do it with these airplanes, but the problem of these airplanes is that we are getting down into the weather, and——"

Senator Jackson: "But do you not lose some fuel coming way down?"

Colonel Abbott: "We lose a lot of fuel, but we can still make good our deployment to Europe, for instance."

Senator Jackson: "Now we are on a global battlefield, and you need greater range. I am trying to get greater range out of the aircraft. What is the difference in your range capability, which means your over-all capability, in a sense?"

Colonel Abbott: "Well, the actual difference in the range could be expressed like this: Our objective is to be able to, with one inflight refueling, deploy our fighters directly from Langley to Europe, for instance."

Senator Jackson: "Which you cannot do now."

Colonel Abbott: "Which we cannot do now. In other words, right now it is a difference between 1 inflight refueling and 2."

. . . *TAC airlift marginal*

A fourth problem, according to General Weyland, is posed by requirements of TAC for airlift. Again this directly affects the mobility of combat units.

General Weyland: "In our airlift, the intratheatre airlift, we have a marginal, what I call a marginal capability or a marginal quantity. Our aircraft are good, we think, but the numbers of them are just barely adequate; and in our redeployment phases, I foresee a growing requirement."

Mr. Hamilton: "What kind of aircraft are we talking about?"

General Weyland: "We are talking about the medium and heavy troop carrier aircraft, that is, the C-119, the C-130 which is replacing it, and the C-132 and an eventual replacement for it.

"Now, the C-130, actually our capability is going up slightly, because the C-130 as it replaces the C-119 has a greater, airplane for airplane, it has a greater capability.

"But our requirements are going up concomitantly for both the Army

and the Air Force. It is marginal. We are meeting all of our actual emergency war commitments that have actually been placed upon us."

Mr. Hamilton: "That is at the present time?"

General Weyland: "At the present time."

Mr. Hamilton: "What is your view as to the situation down the road, say, 1959-60?"

General Weyland: "Well, as I say, I feel it is marginal."

Mr. Hamilton: "That is what position, sir?"

General Weyland: "The end position in the 137-wing program."

Mr. Hamilton: "Would that be adequate, do you think, to meet your requirements?"

General Weyland: "I think it is marginal. As I say, it meets our actual emergency war plan requirements; but as we are going more and more into moving our units overseas, it is becoming increasingly marginal, in my view."

Mr. Hamilton: "What determines the need?"

General Weyland: "There is a combination of requirements for Army forces, both overseas and at home, and for deployment of Air Force units, overseas Air Force units."

The TAC briefings and testimony also reviewed the commands' capability in an all-out war to augment ADC and SAC in performing their missions. Thus TAC day fighters would reinforce ADC. Similarly tactical air forces overseas would be fighting the air power battle in their respective areas.

Naval Air Is Small Aid to Strategic Mission

During the hearings the capability of the Navy to supplement materially the strategic bombing mission of the USAF was explored at some length. Senator Symington said of this question: "This is important, because when the truth about the lag in our Air Force began to be generally known, there appeared an effort in some quarters, press releases, and so forth, to say, in effect, even though the United States hasn't the Air Force we said we would have, the Navy can handle part of the strategic mission. These releases implied that when you add the strategic mission capability of the Navy to the strategic mission capability of the Air Force, you have a totally different picture."

The Navy answer at the outset was generally optimistic. Secretary of the Navy Charles S. Thomas said: "I am sure that another important advantage of the mobile airbase is evident to this committee. Since its location cannot be carefully plotted in advance, it cannot be destroyed by a ballistic missile which must follow a fixed trajectory and be fired at a fixed target.

"Our new attack planes—or what might be termed medium bombers—have recently qualified on the *Forrestal.* They are among the most modern planes in the world. Their long range, such as the A3D Skywarrior's combat radius of over 1500 statute miles unrefueled—1500 miles out, 1500 miles back—makes it possible for the mobile airbases to remain hundreds of miles out at sea, beyond enemy fighter range, while they are neutralizing areas that jeopardize our control of the seas.

"These modern attack aircraft have high speed, and can operate at extreme altitudes. They can make all-weather delivery of high-yield nuclear bombs which, as you know, can be carried on board the mobile airbases such as those of the 6th Fleet in the Mediterranean and the 7th Fleet in the western Pacific, giving them the all-important feature of instant readiness for action.

"I am sure it is evident to the members of the committee that, as I have stated before, with our newest planes now being introduced into the fleet, there will be few important targets in the world which, if called upon, the Navy could not reach with atomic weapons."

And again, Admiral Arleigh Burke, Chief of Naval Operations: "Our forces must be able to withstand surprise attack, and strike immediate, powerful, telling blows in return. Survival under nuclear attack requires a high degree of mobility and dispersion, both of which are basic characteristics of naval forces. If a general war should start with a surprise atomic attack, naval forces operating well dispersed at sea will play an important part in the immediate retaliation. After the first blows on the principal stationary targets are struck by both sides, our mobile, far-ranging Navy alone may remain sufficiently undamaged to carry forward a continuingly powerful attack.

"In modern war we have no time to prepare after war begins. Our military power must be flexible enough to deal with isolated danger spots during periods of cold war as well as meet requirements imposed by limited or global war. Our mobilization base must be decentralized and capable of performing essential functions on the outbreak of war. Our naval forces are singular in their well roundedness to meet all these requirements. They are a powerful, ready force in being. Our reserve fleet of second-line ships is also a force in being which will have many uses at sea in an emergency. Our reserve fleet will require crews to man it, a short period of training, and will cost little to get into action.

"Naval striking power today is already deployed, alert, and ready in strategic areas where trouble can begin. Our 6th and 7th Fleets are on the scene, prepared to undertake any military operation which may be required. They are strong deterrents in cold war. They are capable of immediate, powerful retaliation in case of aggression. During periods of increased tension, they can be quickly and easily reinforced to meet any situation."

. . . *naval strategic capabilities limited*

On closer questioning, substantial limitations appeared to modify any over-all strategic capability of Naval air.

Secretary Thomas: "The only thing I can say, and I have tried to make this clear 2 or 3 times, we are not trying to preempt the Air Force's missions.

"We never have. We are perfectly satisfied with the missions that are assigned to us, but I am only calling to attention the fact that the Navy has a tremendously increased capability. Whenever you bring in planes with a radius of over 1500 miles compared with planes with a 350-mile radius, you have a very much increased capability, and I am only stating that with your

carriers, with your mobile airbases, with a range that have attack bombers on board with a radius in excess of 1500 miles, that you have a capability that could be used if you needed it, and there is no attempt of any kind to say that we are trying to preempt the Air Force's targets and that should be made very clear."

Mr. Hamilton: "That is rather a different point than my question. That goes really to the intent of the Navy, so to speak, whereas my question was addressed to the capability of the Navy, and my question was whether you intended to give the impression that the Navy had a present capability as distinguished from an intention, the capability that would enable it to engage in extensive strategic bombardment against targets on the mainland of Russia."

Secretary Thomas: "No; I don't mean to leave that impression at all, not at all."

Mr. Hamilton: "In other words, you do not intend to leave the impression that the Navy has that capability?"

Secretary Thomas: "No; to cover a lot of extended targets in Russia, not at all."

Earlier in the hearing appeared the following testimony by Vice Admiral Thomas S. Combs, Deputy Chief of Naval Operations (Air):

Senator Symington: "As I understand it, you are primarily interested in targets of naval interest, such as submarine pens; is that not right?"

Admiral Combs: "That is correct; yes, sir."

Senator Symington: "Based on your opinion of the capability of the carrier task force you do believe you could deliver heavy weapons on deep inland targets from a carrier task force if such instructions were given you by the Joint Chiefs of Staff; is that correct?"

Admiral Combs: "Yes, that is correct. If we were to hit naval targets only, we would stay well out for defensive reasons while the other targets were being struck by the Strategic Air Command.

"If we move in close, we would have the ability to hit some of the SAC targets, except on a very much smaller scale, because we do not have nearly as many planes involved, as compared to SAC capabilities."

. . . *carrier use limited in close waters*

The Committee sought to establish whether or not the Navy's carriers in forward positions, the Sixth Fleet in the Mediterranean, for example, could live in restricted waters in the event of an all-out war. No categorical answer was given by the Navy, but serious doubts were raised on this issue. Admiral Combs agreed that it was "vital that Italy remain in the free world if we are going to have carrier activity in the Mediterranean." His testimony concerned the enemy capability to provide fighter escort for his bombers to reach carrier forces in the middle Mediterranean from his current bases. Admiral Combs stressed the necessity of staying beyond the radius of fighter cover for the attacking bombers. "The optimum position could be described as being a fairly good distance from enemy airfields which would base and operate bombers, that we would anticipate would come out for us. If

possible, it is also desirable to have a friendly land mass between us and those bases."

Later, when asked how close can a carrier force get to hostile territory, Admiral Combs testified: "Mr. Chairman, if I had my way running the fleet, I would like to start my strikes toward Russia from a fairly good distance out into the Atlantic or to the western Mediterranean." At another time Admiral Combs stated that the Navy capability to get in close to shore depended on "our ability to control the air locally around there, and to knock out their ability to come out and hit us."

It was agreed that the forward carrier forces would suffer losses, especially if caught in port. On each of two dates chosen at random as examples for the Committee, four of the six carriers in the Sixth and Seventh Fleets in forward areas were in port. Although the Navy testified that schedules were constantly shuffled to keep the carriers at sea as much as possible, the testimony showed that a carrier in port was just as much of a sitting target as an airfield, especially to submarines with a 200-mile ballistic missile or to bombers. It was agreed that enemy intelligence would be aware of the relative position of these fleets at sea and of all carriers in port.

. . . *USAF appraisal of naval capabilities*

The Air Force position as to the Navy's contribution to its strategic mission was stated by General Twining: "We must be realistic about such factors as the probable location of the Navy carriers as well as of the amount of striking power they could contribute to strategic air power, which is small. . . . Under the conditions in which the Navy has to operate, they have a very important job to do. And if I was assured, when we wanted to attack Russia on a strategic mission, that the naval carriers were assigned to General LeMay, operationally controlled, fine. But that is not the case, and I don't know where those carriers are going to be. They have the submarine war to take care of."

The carrier survival question was answered shortly.

Senator Symington: "Do you believe a carrier could live under attack from the Communist Air Force a hundred miles off the coast?"

General Twining: "In this initial attack, no."

Senator Symington: "Do you believe it could live in the eastern Mediterranean?"

General Twining: "No, not initially."

USAF Is Most Powerful Striking Force

As to an over-all estimation of the state of American air power as against that of the Soviets, quotes from testimony by General Twining and General Irvine after their return from Moscow give a fair summation.

. . . *U.S.S.R. approaching technological equality*

Asked how far superior USAF is over the Russians qualitatively, General Irvine said, "My comments are simply I back up General Putt's testimony

that we are not very far ahead of them at the moment, they have been closing the gap over the last 15 years, and so I can only come to one conclusion: That in such areas as ballistic missiles, nuclear bombers, chemical bombers, long-range interceptors, we must do everything we can in marshaling people and resources into expediting those programs to the fullest."

Senator Symington: "Based on the testimony you have given us this afternoon, and on General Putt's testimony, might they even now be ahead of us in those fields?"

General Irvine: "I think it is possible they might be because of some things General Putt and I both observed and how they showed up when they are dealing with some of our scientists in some of the scientific meetings where they appear to be as good in some areas, possibly better, in the very fundamental things of electronics and metallurgy. They are not as good as we are in production engineering."

. . . U.S. ahead in ICBM

Reference has been made earlier to the possible development of the ICBM by the Russians. On his return from his trip to the U.S.S.R., General Twining testified that the United States was ahead in the race to develop this weapon.

Senator Duff: "Do you agree with that conclusion, that in the intercontinental missile we are ahead of the Russians?"

General Twining: "I feel we are, and in pushing that weapon we are strides ahead of them. I don't think the margin is great, but we are a little ahead of them."

. . . attainment of mission

And later,

Senator Saltonstall: "I will ask this question in this way, then: In your opinion, with the B-47 fleet and the B-52 fleet and the B-36 fleet, as they are today, do we have the most powerful striking force on earth at the present time?"

General Twining: "Strategic force, yes; yes, sir."

Senator Saltonstall: "Let me ask this one question: Do you believe in the year 1959, with our B-47 force included in the comparison, the United States Air Force will have in operational units a larger strategic striking force than any other country?"

General Twining: "I would rather say only that, based on current intelligence, I feel that the programs I have recommended, if successfully carried out, will enable the USAF to carry out its over-all mission and the Strategic Air Command to carry out its specific portion of that over-all mission. However, you realize that we are looking rather far into the future."

Air University Quarterly Review

In My Opinion...

IS AIR POWER INDIVISIBLE?

LT. COLONEL B. J. SMITH

THE INDIVISIBILITY of air power is an accepted doctrinal concept of the United States Air Force. It is given lip service by almost all wearers of the Air Force blue—but is it given application? If air power is in truth indivisible, how is it that United States air power continues to appear as a three-headed monster, with each head wearing a different-colored cap and having a different idea as to what motions the body should make?

The Air Force doctrine of indivisibility is clearly stated in Air Force Manual 1-2, *United States Air Force Basic Doctrine:*

> Air forces are an entity. The medium in which air forces operate—space—is an indivisible field of activity. The medium, in combination with the characteristics of air vehicles, invests air forces with the great flexibility which is the basis of their strength. For this flexibility to be exploited fully, the air forces must be responsible at all levels of operation to employment as a single, aggregate instrument.

Even within the Air Force our practice falls far short of our principle. We still think—at least a great many of us do—in terms of tactical air, strategic air, and air defense. Our current USAF organization contributes to, but certainly does not justify, this splinter thinking. Outside the Air Force there is a continued effort to adapt the air vehicle to the tasks of the other military services and to make more difficult the employment of air power as a "single, aggregate instrument."

Why do we in the Air Force continue to violate, in thought and practice, our established doctrine? And why, if our doctrine states a real truth, do the other military services not recognize it as a truth and follow it? Many explanations can be given, and most of them have some validity. But there are two basic reasons why the indivisibility of air power has not been recognized by everyone concerned with its use:

1. *The lack of a usable, widely accepted definition of air power.* Without general agreement as to a definition of air power, it is impossible to reach general agreement as to its nature.

2. *The lack of an accepted functional description of air power tasks.* Because air power is an all-pervading military instrument of many uses, all military men have wanted a share in it. To date there is no generally acceptable description of military tasks that air power must carry out as "a single, aggregate instrument." We speak of air power in terms of naval air, tactical air, strategic air, air defense, or the new, fast-rising Army aviation. These terms do not describe functions, they describe organizations. We need a functional description.

The Definition of Air Power

What is air power? According to AFM 1-2, "the term 'air power' embraces the entire aviation capacity of the United States." But this does not tell us what it is. The word "power" carries with it the connotation of ability to act, to do. Then a definition of air power should tell us what air power can do. Major Alexander P. de Seversky attacks this problem directly in articles appearing in *Air Force* in August 1955 and January 1956. He says, "Air power is the ability of a nation to assert its will via the air medium." This tells us what air power can *do*. On the subject of employment of air forces, AFM 1-2 states: "United States air forces are employed to gain and exploit a dominant position in the air both in peace and in war. The desired dominant position is *control of the air.*"* The term "control of the air" should be understood here as having the same kind of meaning as the old familiar term "control of the seas." Air forces are the agency for the application of air power, and if air forces can gain and exploit control of the air in peace and war, then air power can be defined as *the ability of a nation to control the air.* This parallels Major de Seversky's definition, but puts it in terms that exist in our current doctrine. It has the further advantage of providing an

*Italics supplied.

In recent years Air Force doctrine has rested on two cardinal principles: the indivisibility of air forces and their global flexibility. No serious challenge has arisen to the second point, but the first has been the subject of considerable debate both outside and within the Air Force. Critics have charged that the USAF appears to speak in two languages—that it says all air forces must be under centralized control for proper employment, yet internally it parcels out air forces to SAC, TAC, and ADC and retains these designations even when the lines that once separated the missions of these commands have been blurred or obliterated by new technology. Lt. Colonel B. J. Smith, Instructor in the Air Force Employment Branch, Squadron Officer School, reviews and defends the doctrine of air indivisibility and proposes a viewpoint in line with the tasks of air combat forces.

easy transition from the term "control of the seas," which is generally known and understood. The essential thing is an understanding of the concept involved. The ability of a nation to control the air gives it the ability to do whatever it needs to do *in the air and on the surface.*

Most conventional definitions of air power, including the above-quoted one from AFM 1-2, are stated in terms of composition. They consider air industry, civil aviation, and all military aviation as components of air power. This is not realistic.

The Composition of Air Power

If it is true that air power is the ability of a nation to control the air, then there are a great many elements of the nation's aviation capacity which have only a long-range effect upon that ability. Ability to control the air rests in an air force in-being which has the capability to defeat in battle any other air force that might challenge it. Airplane factories build this air force, but the whole industrial complex of the nation is equally necessary to its building. Is aviation industry, then, a part of air power? No. Are the great numbers of civilian airplanes in this country a part of air power? They contribute much in making the country air-minded, in developing airports, in providing a large group of trained pilots. But can they contribute directly to control of the air? No, of course they cannot. Then they are not a part of air power.

What about the air arm of the United States Navy? Here is a large group of fighting airplanes that can carry out aerial combat missions; surely this is a part of air power. The answer is maybe. If the Navy's air is assigned the mission of control of the air and becomes a part of a force which is responsive at all levels of operation to "employment as a single aggregate instrument," it is air power. If it is not so assigned, it is a part of sea power. In fact, if its procurement prevents the procurement of additional air power, it subtracts from the air power of the nation.

This point is clear: *If the airplane (or as we call it today, the weapon system) is available for control of the air, it is a part of air power. If it is not available for control of the air, it is not a part of air power.*

The Tasks of Air Power

The second reason for our failure to "sell" everyone on the indivisibility of air power and to practice it ourselves is the lack

of an understanding of air power tasks. The tasks which air power must perform in order to gain and exploit control of the air must be described.

To requote AFM 1-2, "United States air forces are employed to gain and exploit a dominant position in the air both in peace and in war." How does a nation maintain control of the air in peacetime? The best and the simplest answer is—have the best air force. Almost everybody agrees on that. But some aspects of this peacetime task of air power are not too clear to all those people who agree that we must have the best.

In order to maintain control of the air in peacetime, the best air force must be in being, not on the drawing boards. It must be capable of carrying out its prospective wartime tasks. To do this, it must have not only the air vehicles in-being, but all the other hardware that makes a weapon of an air vehicle. It must have the trained personnel needed to operate and maintain the weapon system. It must have a base system from which the weapon system can be employed against the enemy. That nation has global control of the air whose air force in-being is the best in all these respects and whose people understand the employment of air power in peace and in war. Thus the peacetime task of a nation's air power is to maintain an adequate air force in-being supported by a continuous study and development of air power doctrine.

Wartime Tasks. Most people will agree on the peacetime tasks of air power stated above. But when the wartime tasks of air power are discussed, there are many differing points of view. The airplane began its military career as an extension of cavalry, carrying out reconnaissance tasks. Later it became an extension of artillery. In some quarters it is still looked upon as useful primarily in these two roles and as a logistic vehicle. Some ivory-tower dreamers have considered the air vehicle as the ultimate weapon, eliminating the need for all other means of warfare. In today's Air Force, we talk about air force employment in terms of strategic missions, tactical missions, and air defense missions. But nuclear bombs have, for all practical purposes, erased the dividing line between tactical and strategic missions, and have made meaningless much of what was once valid in air defense. None of these missions points itself directly at the job that air power must do: control the air.

Counterair. Field Marshal Montgomery, as reported in *Air Force* for November 1955, says: "Therefore the first object in our strategy in the Western Alliance must be command of the air."

AFM 1-2 states that "if war is forced upon the United States, its air forces must be initially committed to the extent required to eliminate or reduce the enemy's air threat." *The first task of air power in war is to defeat the air forces of the enemy.* This is not a job for Strategic Air Command. Nor is it a job for Tactical Air Command, a theater air force, or Continental Air Defense Command. It is the task of all elements of the nation's air power. In carrying out this task the validity of the nation's air doctrine and the worth of its air weapon systems are put to the acid test. The first wartime task of air power is counterair.

Countersurface. In modern war the defeat of the enemy air force is the decisive act. Many thinkers today agree that the decisive stage of the war with Germany ended before the invasion of Normandy, when the Luftwaffe could no longer effectively interfere with Allied air or surface operations. The defeat of Germany in the air did not remove the necessity of an exploitation phase. In future wars it may still be required. If so, the capabilities of air power armed with nuclear weapons will make that exploitation much easier and less time-consuming than in World War II. Surface forces cannot effectively operate under hostile skies, nor can they effectively influence the battle for the air. But once the air battle is won, the winning air force can then devote its energies to defeating the surface forces of the enemy. In cooperation with friendly surface forces, or operating independently, it can wage war against the enemy on land and sea. It may not replace the man with the bayonet, but it might in many instances make his presence unnecessary. It can prevent the overrunning of friendly territory by enemy surface forces during the initial stages of a war while the air battle is still being fought. In Western Europe this would certainly be an air task, considering the great numerical superiority of the surface force of the other side. This air power task is *countersurface.* The ability to accomplish it is derived directly from control of the air and is a part of the exploitation of that control.

Counterresources. So far this discussion has not been concerned with the bombing of enemy factories and cities. During World War II this was considered to be the ideal air power task—to destroy the will and ability of the enemy to wage war. For a few years after World War II and before our only potential enemy had nuclear weapons, our air strategy was based upon our ability to destroy his industrial facilities. But the known threat of enemy attack with nuclear weapons sent us back to the rule book of war. Early in the nineteenth century Clausewitz stated the first object

in war to be the defeat of the enemy's armed forces. Today we know that our first objective in war must be the defeat of the enemy's air forces. We know that once we have defeated his air forces he cannot win. But we may still have to convince him that he has lost. One way to do this is to invade his homeland with land forces. Another is to conduct an air campaign against the resources of his homeland. This is the old strategic air warfare mission by another name. We call it counterresources to make it a parallel of the first two air power tasks and to describe the task.

The ability of an air force to deter war rests largely upon its ability to carry out the counterresources task. It was this ability of an air force that Churchill recognized in a statement made in Boston in 1949: "The continent of Europe would be overrun and London under bombardment but for the atom bomb in the hands of the United States." That deterrent is as effective today as in 1949. No enemy dare attack us unless he can destroy enough of our capability to ensure that his losses from our retaliatory attacks would be acceptable. In carrying out the first two wartime air power tasks—counterair and countersurface—bonus effects for the counterresources task are inevitable. Whatever further counterresources operations are considered necessary will be carried out after the battle for control of the air is won. The wholesale destruction of cities is not necessarily implied. With the spectrum of available weapons and with the delivery accuracies now being achieved, any desired degree of destruction can be caused.

Who Carries Out the Tasks?

In order to maintain control of the air, the counterair task aims at the defeat of the enemy air force. To prevent the overrunning of friendly territory and to defeat the enemy surface forces, the countersurface task is carried out. The counterresources task is primarily an exploitation operation. All these tasks are the job of all available air forces. In the USAF organizational scheme at the present time, SAC, TAC, and CONAD participate in the counterair battle. Both SAC and TAC have the capability to carry out countersurface and counterresources tasks. The naval air arm has capability in each of these areas, but to be fully realized this capability must be applied to these tasks as a part of the "single, aggregate instrument." The overseas theater air forces, both USAF and allied, have a capability in each of the three tasks, but there is some question as to how well even they can be used as a part of the "single, aggregate instrument," since

in the two largest theaters they are directly under the command of the theater commander and are tied to a ground strategy.

THEN IS air power indivisible? It unquestionably is. We might conclude that it is not, in view of the apparent division of U.S. air power. But if we accept the definition of air power as the ability of a nation to control the air, then air power is indivisible. The airplanes can be divided. The other resources which must be used to build air power can be divided. But the capability to control the air is indivisible.

What appears to be divided air power comes about as a result of our failure to understand what air power is, what its tasks should be. The peacetime functions are the maintenance of an adequate air force in-being and the continued development of adequate doctrine for its use. The wartime functions are counter-air, countersurface, and counterresources. In these terms air power is indivisible.

Squadron Officer School

THE COMMAND AND STAFF SCHOOL

A QUARTERLY REVIEW STAFF STUDY

HEY, JERRY? This is Mike! Big Mike, from Germany! . . . Yeah, we just landed. We're that team you asked for. On Operation Candlelight. . . . Sure, with stacks of slides, pounds of poop, jokes—the works! You free after work? . . . Yeah, I'm still here at base operations. . . . How about the Club? . . . Good, I'll meet you there at five."

Lt. Colonel Mike Quinn hung up the phone, picked up his gear, and headed for his ride to the BOQ. Maxwell Air Force Base! Air University. A long way from his outfit at Wiesbaden. Tomorrow his special briefing team would give the current Command and Staff School class a factual run-down of a USAFE operational plan. Tonight was free to spend with Jerry.

To renew an old friendship was not the only reason to see Jerry. Mike and Lt. Colonel Gerald Mason had parted in Germany two years before. After attending the Command and Staff School, Jerry had been kept on as an instructor. This would be a good chance to find out what he thought about the course by now. As a personnel man Mike's comment often decided whether a returnee from Europe was chosen for the command and staff course at Maxwell. His own private opinion had always been that duty time away from operational units was time lost. Nine months for the course was a sizable chunk out of a career! Yet selections had to be made. By what criteria, besides the bare minimum contained in the Air Force regulation, should a man be selected for this course? What good would it do him to attend it? What did the Air Force get out of the deal?

"THE LAST time we saw each other, you'd just got your orders to come to school here. Remember?"

Jerry started for a vacant table. "I'll say I do. Especially the last night at the hotel. It was supposed to be a celebration. More like a wake. 'Here's to this nearly brand-new lieutenant colonel; he's just a skip and a jump

ahead of the hump, needs field experience on his record to get ahead in the world, and the poor dog's being buried in a school.' "

"Well, you don't look like you're pining away. Maybe it's not all that bad," Mike admitted. "You got a club full of cheerful-looking gents here, too. But I've got to say I still feel pretty much the same way about it. It seems to me that the only jobs I ever learned to do really well are the ones I learned by working at. Even flying. I didn't learn to fly in flying school. I just thought I did. Where I began to get good was over in Europe in the big war, when the jerries were chasing my tail all over the sky and I was scared to death."

"No argument on that. Except for one thing. You sure wouldn't have wanted to be in that sky if you hadn't gone to flying school. One way to look at it, schools are a short cut to doing things well. And they fill in the holes and tie up the loose ends, which gets pretty important in staff jobs and in command."

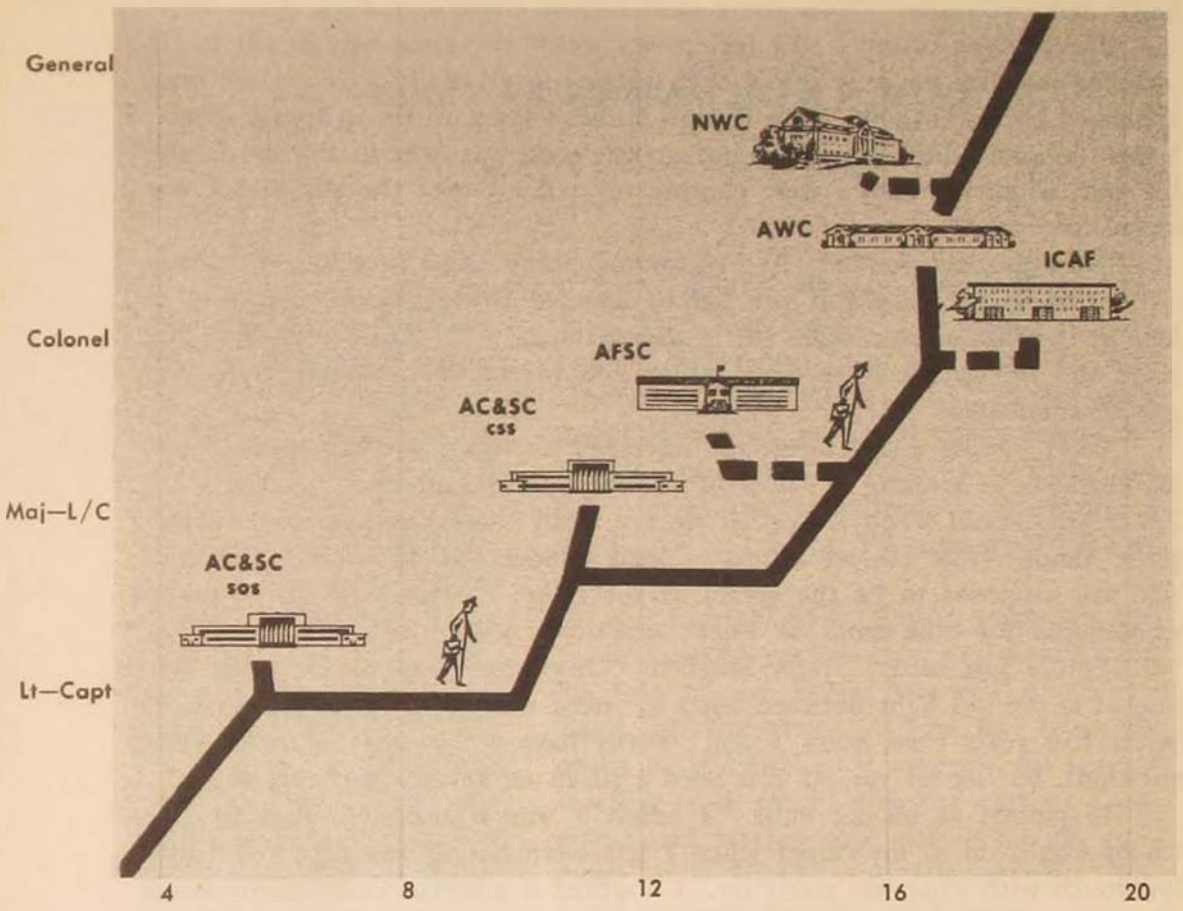
"Okay." Mike settled down and stretched his legs. "But in personnel our big headache is keeping the slots filled with qualified officers. I know what I'm talking about when I say that we are really short on experienced field-grade hands. How can we afford to send hundreds of them—and the ones who are supposed to be the cream of the crop, at that—to your little red schoolhouse for nine months? That's practically killing a whole year."

"You're just bitter," Jerry laughed. "Of course what you're really getting at is the old fight between what we need *now* and what will make us better five years from now. I don't really have a fast answer to all your questions, but let me try. If you need a fill-in as we go along, say so."

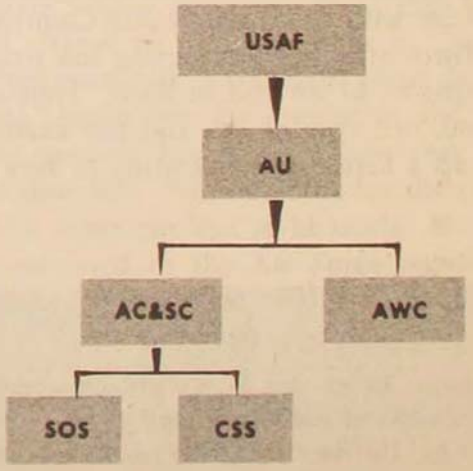
He jabbed at his ice cube. "I admit I was worried about what this school would do to my career when I left Germany. I was afraid I would lose touch with what was going on. I doubted if a school could really teach anything of practical value. I was fairly satisfied with what I was doing for the Air Force. I thought I was a pretty good, well-rounded staff officer. Looking back on it now, I can see one big weakness. I've been a logistics staff officer with the Tactical Air Command most of my career. Like a lot of Air Force officers I was getting too wrapped up in my specialty. The job was getting to be an end in itself. Here in CSS I've gotten away from *one* command, one type of job and the narrowness that goes with it—and have picked up a better understanding of how my work fits in with the mission

A key point in an Air Force officer's career is the freshening and broadening of his knowledge of air power and of the international environment in which it operates. In Air University's program for professional education, the Air Command and Staff College provides this opportunity for officers through the rank of lieutenant colonel. Having previously studied the Squadron Officer School (*Air University Quarterly Review*, VI, 3, Fall 1953, 96-113), the Editors of the *Quarterly Review* now review the Command and Staff School. They are greatly indebted to Major Kenneth E. Jones and Dr. Raymond L. Walter of the Command and Staff School faculty for their substantial contribution to preparation of the article.

Professional Education in a USAF Officer's Career



Organization of USAF Professional Education



Building, equipping, and training air forces to keep them ready for any emergency calls for the highest standards of professionalism. To implant the qualities required by the USAF of its officer corps, Air University operates the Air Command and Staff College, comprised of the Squadron Officer School and the Command and Staff School, and the Air War College. These air colleges offer professional education to promising officers at intervals in their practical experience through the first twenty years of commissioned service. The Command and Staff School is charged with increasing the professional understanding of selected Air Force majors and lieutenant colonels. To augment the in-service educational system a number of United States Air Force officers are sent to the three joint-service colleges: the Armed Forces Staff College, for lieutenant colonels, and the Industrial College of the Armed Forces and the National War College for colonels.

of the whole Air Force. I think I'm able to perform my job—whatever it is —more competently than I could before. That's the big thing about this course."

"Oh, I get it. They've brainwashed you." Mike struck a Man of Distinction pose. "You're a 'big picture' man now."

"Wait a minute, Mike. I've got a package here in my brief case that may do the trick better than I seem to be doing it. It's a kit of handouts and pictures on the school that we've assembled to use for briefings. Here's a statement on the school philosophy that will give you the why and how I'm trying to put across."

Philosophy of the Command and Staff School

Air Force officers carrying out the complex, global activities of the USAF are personal, professional, and frequently official representatives of the United States throughout the world. As such they must understand air doctrine, strategy, tactics, and techniques. Also they must be able to apply these in the context of widely differing foreign ideologies and to evaluate the political, economic, and sociopsychological implications of USAF operations as foreign nations see them. To these ends the Air Force sponsors a program of advanced formal education for its officers.

The CSS curriculum focuses upon the knowledge, attitudes, and skills that field-grade officers need to apply air power effectively. It rests on the following basic beliefs: To merit respect, Air Force officers must have education, a high standard of ethics, and discipline. They must be dedicated to the national interest and to the obligations of their status. They must think rationally in order to face ever-changing problems resourcefully. They must know how to use the tools, techniques, and doctrines of their profession. They must enhance their skills in command, leadership, staff techniques, communication, and human relations. They must grasp the impact of scientific, technological, and psychological developments affecting air power. Educational Philosophy. *The curriculum combines two fundamental educational concepts: general education, or synthesis, and specialist technical education. The general program broadens background knowledge and understanding of USAF functions and operational capabilities. Competence in career fields is increased and exploited by research studies and exercises. The Command and Staff School must provide both an intermediate and a long-range return to the USAF. A comprehensive yet flexible curriculum stimulates objective thinking and permits each student to exploit his growth potential. Specialized talents of the student body are utilized in solutions to USAF problems and in the development of doctrine. Constructive evaluation helps the student correct his weaknesses and contributes improvements in instruction and curriculum. Experience-sharing among students of varying backgrounds broadens understanding. In this graduate-school atmosphere mature individuals are expected to bear responsibility for benefiting themselves from these opportunities for learning.*

MIKE flipped the paper back. "Well, son, some of this looks all right, but one or two items give me a bad case of suspicions. This business of 'foreign ideologies . . . political, economic, and sociopsychological implications of USAF operations' doesn't arouse wild enthusiasm in me. Suppose I leave dear old CSS for duty with a branch of General Weyland's F-84F college at England AFB. I might dazzle the local airplane drivers with my knowledge of the economic conditions in Red China, but how do I do as commander of a bent-wing 84 outfit? *That's* what I want to know. And what's funny about it?"

"I was listening to myself two years ago," Jerry laughed. "I don't know; I guess you have to see this philosophy in action before you realize just what goes on. We'll do that tomorrow—look at the course in operation."

"Okay," Mike shrugged. "I'll bring along the theme music for 'The March of Time.' "

"But about commanding this F-84 outfit," Jerry said, "from the name of the school you would expect to get a lot of straight command and staff work, and you do. We don't train a man for a specific command assignment, but we build up a pretty good check list. The course starts off with some very basic instruction in common skills—speaking, writing, and so on—and a short unit about the elements of a nation's power, and then comes a big block of instruction in command and staff work. And let's get one thing straight from the start. This is primarily a command and staff school. It takes the man beyond his Air Force career field into a broader background on the Air Force and its place in the national and international picture. The school hopes to give the commander the information he needs not only to be a better commander but to know how to make better use of his staff. Staff functions are explored and staff operations are practiced realistically. The future staff member becomes so familiar with the commander's problems that he can share everything but his ulcers with him. And each staff member learns enough about the jobs of other staff members so that he can work with them intelligently. Here's a dopesheet. I'll brief it down for you."

Study of Command and Staff

The course is divided into two phases. In addition to the active-duty officers, short-term reservists, Air National Guard officers, and Allied nationals attend the unclassified Phase I. Only USAF active-duty officers and Allied officers cleared for Top Secret can attend Phase II. Command and staff material appears early in Phase I and recurs for detailed treatment at appropriate places in the course.

In the unit of instruction on command, "The Nature of Command" is studied first. The commander is the key man in a unit; success depends on his decisions. This course provides a logical approach to the subject of command. It brings to the CSS student the experience of senior officers and contemporaries. Students investigate two extremes in command—the commander who uses committees to solve most questions and the commander who makes all decisions himself. The tools of the commander—personnel, resource management, operations, finance, and public relations—are discussed. As potential commanders, students are encouraged to develop attitudes and approaches incorporating the strengths of their own personalities.

The development of air staffs and of an air-staff philosophy as related to the Air Force mission is studied next, followed by close scrutiny of major Air Force staff functions at the levels of Headquarters USAF, the major air command, and the wing. Students learn how to integrate staff action and support a command mission, stressing coordination among staff members. By examining each staff area functionally the student prepares himself to participate in a realistic exercise emphasizing integrated staff action. Here students operate as a staff to develop a detailed command plan. The faculty acts as a control staff.

After this first experience students apply their newly acquired skill to the typical day-to-day functioning of a military staff. For example, they develop a complete plan for the conversion and training program of a USAF wing from one type aircraft to another—the dates when the aircraft are received, the prior training required (including that for pilots and maintenance), the base installation changes that are necessary, etc.

In Phase II students in seminars continue to operate as commanders and staff members, particularly in exercises involving staff action. In addition to staff operation at the wing level they study USAF-level planning and its meshing into the over-all planning cycle. The philosophy of planning in the Air Force, in other agencies, and in industries and the planning cycle at USAF Headquarters are studied.

Students also examine the programing that grows out of planning: the types of programs, their development, and their use by Headquarters USAF, the major commands, and other Government agencies. Air Force problems during and just after World War II and the development of the programing system are reviewed. The content and purpose of USAF program documents are studied. Students inquire into the formulation of Air Force objectives and their translation first into program guidance and then into detailed programs. They apply this knowledge to programing a practical problem, which provides a background for their work as members of a staff for the remainder of the course. Subsequent exercises involve use of air forces to achieve U.S. national objectives in situations ranging from peacetime to global war. Midway in Phase I and continuing through the first half of Phase II, students are assigned research study areas. These studies involve real problems facing the Air Force. Nowhere in the world do we have collected in one place such a vast pool of experience, coupled with the time objectively to consider these urgent Air Force problems.

JERRY leaned back. "That's a rundown in the command and staff area. The knowledge, understanding, and skills gained in this area are extremely important, I think. The instruction is cumulative in that most of it is used in exercises and seminars again and again during the course. I believe I've gained a great deal from this experience and that it has made me a better commander and staff officer. This *must* be true for anyone who comes here and applies himself."

"Maybe." Mike shrugged. "I'm a school-of-hard-knocks boy myself. This learning your job in school sounds like a phony short cut."

"Remember General Ryan? He brought us a briefing team from FEAF last week. Six of his key staff officers are graduates of this school. He wants more. How about Colonel Regent? He had part of our old bunch at MacDill a few years ago, remember—John Reeves, Wilson Ortigo, and Joe Watts? Good airplane drivers—but staff work? Al Regent was lucky he kept his eagles with that gang on his staff. Well, the three I mentioned are back with Al—Smoky Hill now—but they've been through Command and Staff School since we knew them. Al says for the first time his bunch is really a staff. The routine goes on so smoothly you don't think about it and those ex-knuckleheads are coming up with their own projects. He's happy as a jay bird. And these two satisfied customers are just ones that you and I know. The school has a whole folder of letters from other commanders. Same old story. *They like their staff people to be graduates of this course.*"

Mike grinned at his friend. "You're really in afterburner, aren't you, son? What you say sounds good. I could do with a little inside stuff on something like staff studies. The Old Man says he needs a staff study of my staff study sometimes. But I'm still not convinced. Why couldn't all this poop be bound up in manuals and shipped out to the field?"

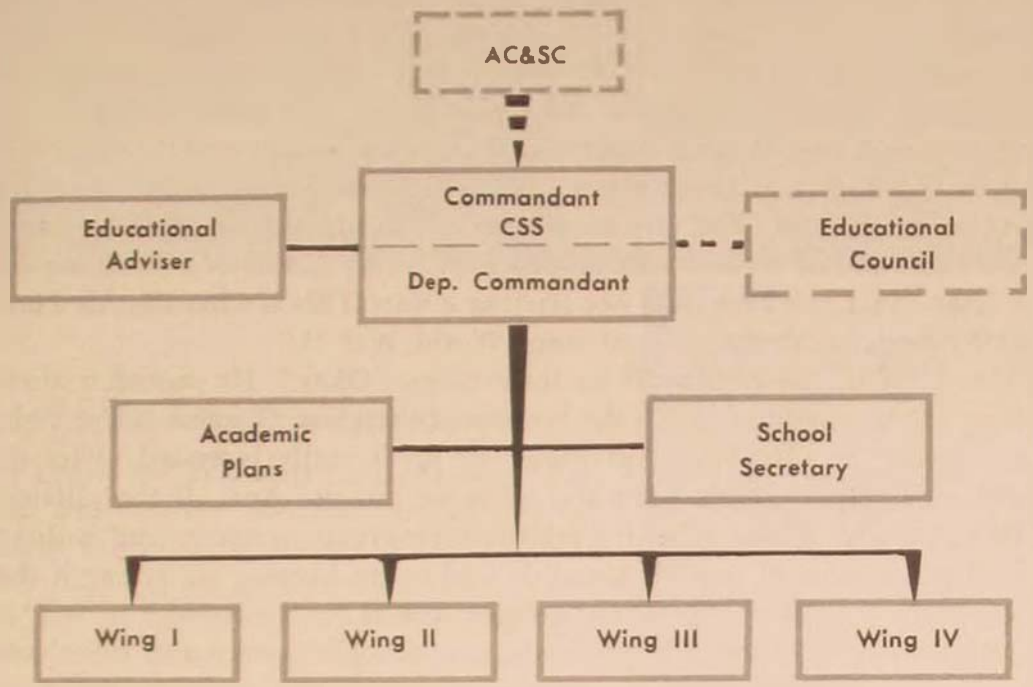
"Sure, sure. Maybe you guys in USAFE Headquarters have lots of time to wade through stacks of manuals. In operational TAC units we never had too much time for that. Always a fire to put out—half a dozen deadlines and a couple of flaps in the mill! Look, Mike, you know a man can improve on the job, but it's almost impossible to develop really new techniques and do a job too."

"Yeah, I see what you mean," Mike said. He scrubbed at his ear. "Yeah."

"Besides, much of our instruction is given by experts. All of the instructors assigned here are highly qualified people, and we draw on talent from every part of the United States. We invite people like general managers of large corporations, commanding generals of large Air Force units, and university professors, to lecture to the student body. This is probably the only time in your life that you'd ever get a chance to hear so many outstanding authorities give the straight dope on these things we've been talking about."

"Well, all right," Mike agreed. "I wouldn't mind polishing up a little

The CSS Organization



A well-developed and coordinated curriculum is assured in the organization of CSS. The Academic Plans Branch develops the curriculum outline, including content and its organization, into units for presentation. The Educational Council then assigns each unit to a specific CSS wing, which is responsible for developing and presenting the unit of instruction. Proper coordination between units is assured by the composition of the Educational Council and numerous briefings given the Council by the wing developing each unit. The Educational Council, under the Deputy Commandant, is composed of wing chiefs, Chief, Academic Plans, and Educational Adviser.

The School Secretary administers personnel, students, and equipment.

Each wing staff is composed of eighteen Air Force officers whose duty it is to prepare and present the periods of instruction and advise students on academic matters.

in some of those staff skills you mentioned, but what about that philosophy stuff? Why sit through all that business about ideologies and economics before you put this staff knowledge to work in the exercises? What's the matter? Don't you like the way John Foster runs the State Department? As long as conflicts remain ideological, I really can't get cranked up about them. After all the name calling is finished and the diplomats run home wringing their hands, that's when the Air Force starts to operate."

"Now you're making my own points for me." Jerry hunched forward, stabbing the table top with his finger in his intensity. "That's not the real function of the Air Force, or of your job, or of your headquarters. And you know it, if you stop to think about it. That's one point—and there are lots

of others—where this school pays its way. It helps people like you think through these problems."

Mike said, "What do you mean, I haven't thought it through?" He rattled the ice in his glass and glared at the waiter's back. "You guys got a monopoly on noodle work? You're talking about the business I've spent eight hours a day on for fourteen years. I don't claim to know everything about the Air Force or air power, but I sure know what makes it tick."

"Keep cool, boy. What I mean is that there's a lot more to the Air Force job than fighting. You know this too. You've heard about air power being peace power for years. And you know that's more than a slogan. How much of your work and of all the work at USAFE is really aimed at convincing the other fellow that he's better off not starting a war? This is what the Air Force has really been all about—at least since World War II."

Mike ran the glass around in little rings. "Okay." He scored a check point on the moist surface with the bottom of the glass. "I guess you're right. Even a lot of the actual 'war' planning we do is really intended to let the other side see how ready we are and what we can do. And all the alliances like NATO, and the community relations programs overseas, and military aid, and other parts of our workload do add up to keeping up strength that will convince the other guy he can't win a war if he starts one."

"Right. And in a lot of ways this is a more sophisticated and more complex job than fighting a war."

Study of National Power

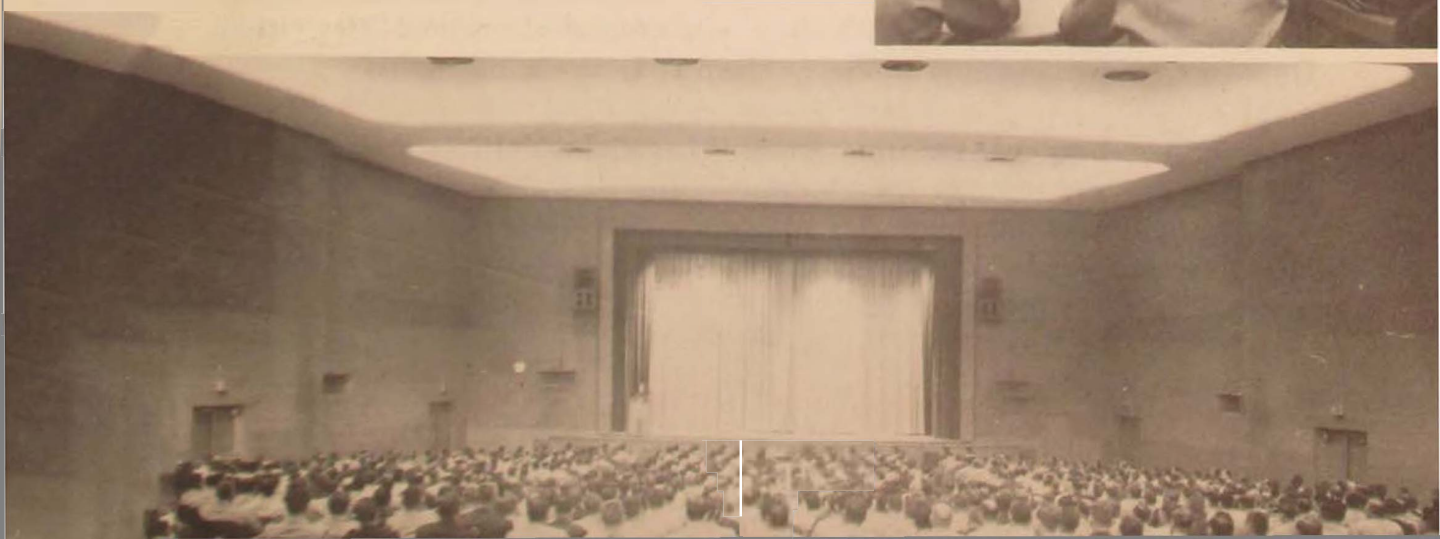
The CSS curriculum makes the student aware of differing ideologies. Lecturers explain the economics, politics and government, religions, and social customs of various nations. A discussion of the sources and the nature of conflict precedes a study of political ideologies. Afterwards, as a foundation for the effective use of air power, students examine the elements contributing to a nation's power; national objectives, policies, and strategies; and instruments of national policy. Later they concentrate on the ideologies and elements of power of specific nations. Phase II assumes very much the pattern of a commander's estimate of the situation, as the ideologies and elements of power become more particularized and merge with other intelligence items in planning.

The Soviet Union and its European satellites receive close attention. The Communists' objectives and the elements of their national power are evaluated. Soviet and satellite military power, especially air power—the Communist military order of battle—are carefully studied to provide a position from which to plan for the use of U.S. air power. Red China receives individual treatment, with emphasis on her development as a world power, her objectives, and her strengths and weaknesses.

The origin and development of strategic guidance for the USAF are studied in detail. The National Security Council, as the policy source of USAF planning, is examined in its role and in its effect on the armed services.

The Academic Center

Air Command and Staff College's completely new and modern academic center (above) houses the growing college. The Command and Staff School occupies the building at the top of the group. The other buildings (clockwise) house the weapons courses and the Air War Room, the administrative offices, the Academic Instructor Course and language and reading laboratories, and the Squadron Officer School. Outside the circle five BOQs have been built and five more are under construction. Centering the academic circle is the million-dollar Air University Library. USAF and Allied officers (right) work in pleasant surroundings in the library's main reading room. The library contains more than 125,000 books and bound journals, more than 500,000 classified documents, and complete files of Air Force regulations, manuals, and directives. Command and Staff School facilities include spacious seminar rooms (right, center) and a 1200-seat auditorium (below), at the rear of the building.



The review includes study of the national weapons policies and the contribution of the Office of Defense Mobilization, the Bureau of the Budget, and the Department of Defense.

The nations of the non-Communist world are scrutinized thoroughly. Especially considered are their national objectives and the military significance of their attainment by political, economic, or sociopsychological elements. The various alliances of the Free World are analyzed and evaluated. The vulnerability of the Western Hemisphere is examined by studying the strengths and weaknesses of North, South, and Central American nations and the value of existing treaties. An analysis is made of the effect on the world balance of power of nations not committed either to the Soviet bloc or to the Free World bloc. In essence an order of battle, including all elements of national power, is developed for the Free World.

Following further study of the National Security Council, the CSS student is ready to begin planning for the use of air power. From discussion of joint military planning he acquires an understanding of the philosophy, theory, and practice of USAF planning and of its embodiment in USAF programing. He becomes aware of the use of USAF program documents at the major command and wing levels and of the information the lower command levels must supply to Headquarters USAF in order to receive good programs for carrying out their missions.

JERRY tagged a passing waiter for a match. "Mike, I sound like a salesman for Air University stock, but before you leave I'm going to convince you that you not only ought to pick your Staff School students with care, but that you ought to try to make this course yourself! With the total of thousands of years of Air Force experience represented by the student body—a lot of it combat experience—there's a great exchange of information between students, particularly during research studies. That alone is a terrific learning outcome of the course."

"You sure sound convincing!" Mike said. "In fact, I think you've overpowered about half the people in the room."

"Okay, I read you. Loud and clear. I'll call off the Air University Story for tonight and relax a little. Your USAFE team isn't on until tomorrow afternoon. You'll stay out at the house with me while you're here, of course. I've already told Mary to move the boys in together, so you'll have a room to yourself. In the morning I'll show you around the school—Hey, look! Didn't we know those guys in flying school at Luke Field?"

"DID YOU hear that kid from Edwards last night?" Mike turned to Jerry threading the car through the morning traffic toward Maxwell. "The test pilot for the rocket job. Somebody asked him what he flew between test runs. He comes out with, 'Oh, conventional types—F-102's, F-104's, stuff like that.' Makes a man feel ancient."

"Yes, that it does."

"It's a good thing we talked about the Staff Course before we ran across that gang of 'Luke Alumni.' That was quite a briefing you gave me last night, Jerry. You sure have developed a lot of enthusiasm for the course and the school. That's the thing that really interests me. But with all these different areas you're trying to cover—staff, planning, ideologies, economic factors—the school sounds pretty confusing. Right now I've thought up a new name. Why don't you call it the College of Miscellaneous Knowledge?"

"Not so fast, chum. All the parts form an interlocked and inseparable whole. The curriculum is planned as an integrated whole, not just a miscellaneous group of subjects. We break the course into units and program the units by wings. For example, we decide who will have the development responsibility for the air exercise in Phase II and what should be cranked into early instruction to prepare the students to work in the different parts of the exercise. This business of 'the use of air power' in exercises draws support from a large part of the curriculum."

"Doesn't a course like this sort of stagnate? How do you keep any flexibility in it?"

"The program for the year to follow is always under scrutiny. Right now we're trying to give next year's curriculum more meaning in the USAF programing area. We want the students to understand the purpose and impact of planning in the USAF, and in the Joint Chiefs of Staff, and to appreciate the background and the necessity for planning at Headquarters USAF level. We also want to give the students better insight into the problems confronting the Air Force during and just after World War II and how the programing system was developed to help solve those problems. That is what my shop—Academic Plans—is working on right now."

Jerry slipped into the stream of cars entering the Air Command and Staff College area and swung around the huge oval road encircling the cluster of sun-tan buildings.

"Some layout!" Mike admitted.

"The buildings are nearly new. The Command and Staff School moved in with the class of 1956. The large building in the middle is the library. The students really use that library. After they graduate, many of them come back to research some subject that has come up in their new job."

"Sort of a research center, huh?"

"That's it," Jerry said. "And that leads me to something else, our research studies program. Very early in the course we give qualified students specific problems sent to us by Headquarters USAF or by some command—current, real problems in the field. Maybe, for instance, they want specific recommendations for personnel requirements in electronic countermeasures. We also study specific parts of the world where a cold war situation looks as if it might suddenly get hot. Or develop a new SAC readiness concept. Or—here's one in your area—study the sources and proportions of officer procurement for the next 20 years. Then we forward our findings and recommendations to the requesting headquarters. Other research studies may take a look at the future of the Air Force, say in 15 or 20 years. Some of these studies or parts of them have really hit pay dirt."

"Hey, this sort of thing is what the Air Force can use. And it sounds like a lot of fun to get your teeth into a problem like that. What about specialized problems. Do you have any of those?" Mike caught himself up short. "Looks as if you got me going on that one."

Jerry grinned at him. "Yeah. Plenty. Staff specialists in the class make more studies, projecting the state of their art in such areas as communications-electronics, missile propulsion, and so on. Then student groups take these studies and decide the operational impact these developments will have on the future air force. This is the point where all the effort of months comes to focus, when they try to come up with new organizations, strategies, and tactics that seem adaptable to the USAF of the future. For example, what kind of an organization do we need to handle the ballistic missile program? Or how should we use nuclear-powered aircraft? Or what are the ideal types or groups of weapons for the air defense inventory? These research studies are *used* by the USAF. Any student who comes here looking for a batch of pat questions and answers is on the wrong train. We try to develop real creative thinking at CSS."

JERRY pulled into a parking space back of the CSS building. "Remember the old Air Corps Tactical School. It was a small school for a real small, pre-World War II Air Force. Yet the lads who went through that course developed the tactics and doctrine that governed our use of air power during World War II. Now compare the potential of what we had then to what we have in this class at CSS. We've got 12,000 years of Air Force experience in the school. This is more experience than we had in the entire pre-World War II air officer corps. If that bunch came up with an operational plan that, with few changes, was used by a three-million man Air Force for four years, think of the potential for similar products that exists in every CSS class! Okay, sport," he punched the thoughtful Mike in the side. "I know, still in afterburner, you say! Damn it, I *am* sold on this course. I think it's *good;* and frankly, I think *you* need it."

Mike laughed, "Keep talking, while I rummage around for an old CSS application blank I think I stuffed in my pocket during a fit of stateside blues."

The two lieutenant colonels turned left from the parking area and went up the steps to the CSS building entrance near the main auditorium.

"Look." Jerry took Mike by the arm. "This auditorium is where most of our lectures take place—all air conditioned—seats 1200."

They paused at the doors to the huge hall.

"The course is divided into about half lecture, half seminar. A seminar

is a little discussion group of, say, 15 students. They have a small room equipped with a blackboard, two polar projection maps, and a good, solid, soundproof door to keep the angry shouts from rattling around in the hall."

He led Mike to the foyer and pointed down the long hall lined with seminar-room doors. "In those little rooms that you see there, opening on the hallway past the coffee bar, many of the studies and papers are hammered out. They also use the seminar rooms for speaking and writing exercises."

He turned back to the auditorium. "Let's go on in. You know, the student body is broken up into four wings. Today a Wing II study group will brief the staff, faculty, and other members of their wing on a study they have made into the use of large turboprop transports for primary logistical support of our forces in Europe."

Mike perked up. "I'd like to hear that. It sure would solve a lot of headaches for USAFE if something could be worked out on that."

"I thought you might be interested. See how your briefing team fits in here? We want you people to give the students and faculty your operational concepts for your command and to let your hair down in discussing your main problems. Here, let's slip into these seats in the back. The briefing will start in about ten or fifteen minutes. While we wait, I can fill you in on how the school develops speaking and other communication skills."

Communication

Throughout the course students work to improve their ability to speak, to write, to solve problems, and to participate in committees, so that they can better present their ideas orally and in writing. First they review oral and written methods of communication. At the same time instruction begins on logical thinking, scientific problem solving, principles of human relations, and use of the library for research and writing of staff studies. The last part of the instruction encourages the student to develop a professional library. He receives a list of books as recommended reading for the professional Air Force officer. He must report on some of these in seminar. Assignment of books or articles on world affairs supplements auditorium lectures.

Instruction in communication techniques and skills pervades both phases of the curriculum. The first week's exposure convinces the student of his need to improve his speaking and writing and suggests how he may do so. The program to develop speaking ability begins with the student's introducing himself to his fellow seminar members. Soon he gives a three-minute practice speech, followed by ten-minute speeches recorded on tape and immediately analyzed by an experienced faculty member. The first speech in the second phase is impromptu. Finally the student presents a fifteen-minute

speech to his wing, a brief of his special research project. At each meeting a different student briefs his seminar on a subject of current interest.

Writing is also emphasized throughout the curriculum. First a test shows the student his errors and their cause. After exercises in grammar, he writes articles and military letters, which a "buddy" officer edits. The rewritten article is evaluated by a faculty member. From time to time students must report seminar decisions and conclusions in writing to a faculty member. In Phase II each student writes an article and the best ones are published in commercial or service magazines. The purpose is to encourage officers to think about the role of air power in U.S. defense and to improve their ability to discuss it.

Related to the development of communication skills is the development of leaders. The Command and Staff School is designed as an adult, professional education program, emphasizing learning rather than teaching. In many situations the individual learns without formal teaching. Each student is a participating member and at times the leader of his seminar. As leader he plans the agenda and presents it to the group. If well prepared, his agenda serves as a guide for discussion for the duration of the seminar. In those seminars centering around problem solving, the faculty member contributes by commenting upon the student's ability to recognize and react to the various phases of problem solving, upon the effect of his personality traits, and upon his preparation.

THE briefing over, Mike and Jerry walked to the coffee bar for the break. After a few remarks about the quality of GI coffee, the conversation returned to the Command and Staff School. Mike was thinking about what he had just seen in the auditorium.

"Jerry, I know that bright-looking young major doing the briefings was probably handpicked by his committee because of his platform manner. But I heard the two instructors sitting next to me talk about him, and one of them said when that lad first came to this school he not only read his pitches but read them poorly. Some improvement! You know, we have a hell of a time getting good briefing people. As a matter of fact, I'm afraid we'll show you some horrible examples of what I'm talking about during our briefing today. Pretty good poop in that boy's report, too—I recognized a lot of it as based on a study by Douglas Aircraft a few months ago, but there were several sections that I didn't recognize, and he sure had a new twist there in the recommendations. It just might work, too."

Jerry, like any good propagandist, leaped with both feet into the breach he thought he saw opening. "Your command is no different than any other, Mike. During our field trips, all the commanders mention the shortage of good speakers among their staffs. Now we can't possibly turn out polished orators here, but I don't believe a single officer comes through this course who doesn't improve his speaking ability to some extent. Some, like that Wing II briefer, really show startling improvement."

Mike nodded. He could see that a little expert coaching could go a long way toward correcting problems in speaking.

"That briefing was one of the prime products of the course," Jerry continued. "Remember, we don't have a bunch of Joe Averages coming through this course, old buddy. These guys are selected individuals. We operate on the basis that this adult, professional group needs emphasis on individual learning and real understanding of what we try to put across. I'm talking about things that go beyond the ordinary academic ability to recite back facts and information *as* facts and information. We give the student the facts and information all right, but then we put him in a series of situations where he has to apply them. This way he really absorbs the information as applied knowledge. He knows what to do with it."

Mike suddenly remembered a joke, noticed Jerry's extreme seriousness, and became serious himself. "But something bothers me. I've been in the blue-suit business long enough to know how a lot of choosing up for school comes about. The Old Man is really in a bind—enough people, maybe, but not the right kind—a few real professional types—the kind you need for this course. So who does the Old Man want to send to school? Some character who seems to spend most of his time sitting around belching and picking his teeth. An obvious choice for a snowed-under commander to make."

Jerry smiled at this thrust. "Selection! I knew there was something I had forgotten. Look, I'll admit some commanders occasionally send an eight-ball to school to get rid of him. But it's getting better all the time. After all the RIF's and so on, we don't have many real dogs in the officer corps."

"True enough," Mike said. "The personnel records show me that."

"Besides, that's an old GI rumor. I don't think it happens too often. Maybe more a few years ago, but now it'd be a real tough business to run a sleeper in here, and here's why. Each of the major commands is given a quota to fill for this school. The command has to nominate twice as many as will be selected to attend the CSS. And it has to select only outstanding officers who will profit most by attending the CSS."

"Yeah," Mike muttered. "I know. I'm a personnel man. 'Don't just give blood. Give your best blood.' "

"This list is then sent to Headquarters USAF," Jerry went on serenely, "where a further study is made of what each guy's attendance at the CSS will return to the USAF as well as to the individual. The final selection is made by Headquarters USAF."

"Fine!" Mike said wryly. "But what if USAF only has a choice between dogs and more dogs?"

"Couldn't happen," Jerry rejoined firmly. "Our records show that officers selected for the school have effectiveness reports considerably above average for those in their grade and with their length of service. One proof that it works is that the percentage of the student body promoted is way ahead of the Air Force-wide percentage. There are still lots of flaws in selection, but most of them are caused by other priorities on personnel and by the limitations on information in the files of the officers. Even so, the CSS classes are undoubtedly composed of above-average officers."

CSS Exercises

Exercises in both the closing phases of the Command and Staff School course give meaning and perspective to all that has gone before—the reading, the lectures, the research, the seminar arguments. Here the students put what they have learned to work. They learn that the application of academic knowledge is not confined to answering questions on quiz shows, but becomes the tool of the air commander and the air staff officer—and thus deserves their serious respect. The exercises are carefully planned by the faculty to give the student plenty of opportunity to use what he has learned. He is encouraged to use his full imagination in situations where mistakes are not fatal. Usually these exercises are played in a sequence of four steps. A typical one opens with each seminar receiving a copy of the faculty-prepared folder setting up the problem, the general situation, and the intelligence data. The faculty selects a commander and each seminar talks over the problem and prepares a commander's concept. Second, the seminar organizes into staff sections, sets up a war room, reduces the information into usable tabular form, and works up its estimate of the situation. The third step sees the commander make his decision on a course of action, after which his staff works out an operational plan. For the final step each student staff briefs its faculty adviser on its plan. The faculty may pick the best seminar plan from several seminar plans and have the students responsible brief the entire class for its critique. Or the faculty may give all the seminars certain enemy actions, each seminar then playing through the situation on its own plan. Either method of evaluation poses a severe test of the seminar's solution.

Exercise: theater air defense. Location: Far East. The seminars in the Command and Staff College, having received their folders from the faculty, extract pertinent information and work on a commander's concept (1). The student staff tabulates its intelligence information, in this case intercept status (2). (Since this exercise is in the first phase of the course, the intelligence has been provided by the faculty and is unclassified.) As the work on displaying of information and tentative deployment of forces nears completion (3), the student staffs plunge into the writing of their operational plans (4). Following the briefing of the faculty adviser, the students play through their plan (5), "fighting" an enemy air force represented by a series of faculty instructions. Since they must rely on the force dispositions that they made in their operational plan, the "battle" exposes weak spots and deficiencies in tactics, strategy, and concepts.

"Okay," Mike grunted. "But why all this fuss about the best? Why not settle for a cross section? That's what the rest of us have to do."

"Who do you want running this Air Force five or ten years from now—a cross section or the best officers we've got? Remember, attendance at this school will be the final professional education for about 85 per cent of those attending, and only a third of the majors and lieutenant colonels will ever have *this* chance. We've *got* to pick the best! By the way, my friend, the fact that you haven't been selected for this course yet hasn't any bearing on your attitude, has it?"

Mike threw up his hands. "Go easy with the needle, son, you might hit an artery!"

"Look, Mike," Jerry steered him out of the coffee bar toward the stairs leading to the second-floor seminars. "You still have a half hour or so before your outfit begins that briefing, don't you?"

Associated Activities

Command and Staff School bulletin board displays a well-planned program of extracurricular activities including flying, dancing, social gatherings, and athletics. A large number of jet trainers, together with C-45's and B-25's, is assigned to Maxwell so that students can maintain flying proficiency. As with the civilian college, not all of the activities associated with attendance are aimed at academic targets. An active sports program continues throughout the course and involves competition between seminar groups. Each class has its share of seminar parties, cocktail hours, and group dances, but the social event of the year is the school graduation ball. A recent one drew nearly 1000 couples.

"Yeah," Mike said. "I'm going to meet them in the auditorium. Anything else we can take a quick look at before the main performance?"

"A bunch of the USAF's most select males are upstairs right now in a real hassle over current USAF doctrine," Jerry answered, starting up the stairs. "Remember, I've told you this curriculum isn't static. We spend an enormous amount of effort keeping it up to date with the latest developments. Actually we're dealing with future doctrine, although we study current doctrine. This seminar is discussing a controversial point in a lecture given by an officer from the Evaluation Staff of the Air War College a few days ago. It's a point that may change some of our courses next year, particularly the slant of one of the major exercises. Go on in. We'll sneak into a corner and listen."

Air Doctrine and Analysis

In the first part of the curriculum the students become acquainted with current air power doctrine. After Christmas the emphasis is on analysis of present doctrine and its use in the future exploitation of air power. Early in the course students become acquainted with the doctrines of the Army and the Navy. Considerably more time is spent on basic USAF doctrine and the various manuals setting forth the application of air doctrine. Then, after the research studies and special projects are started, the students become more concerned with analyzing the effectiveness of application of this doctrine. Planning and programing are tied in definitely with air doctrine. The last units of the Command and Staff School curriculum, dealing with USAF operational capabilities in cold war, restricted war, and total war, all point up the need for a definite doctrine to be followed by the Air Force in achieving its mission. These units, following the USAF plans and programing study, force the student to analyze and evaluate the present air doctrine as applied to achieving U.S. national objectives in the future. These special studies also point up new developments in science and industry—possible break-throughs in science and in the art of development. They all indicate that the present air doctrine must be evaluated against the air power of ten or twenty years in the future. So the final part of the Command and Staff School deals with a study of the present air doctrine and an analysis of how usable it will be in 1965, 1970, or 1975. The students carefully analyze not only the doctrine but the way in which this doctrine is published. Considerable thought is given to the dissemination of this doctrine, for this is essentially a part of the Command and Staff School mission to study, evaluate, and disseminate USAF doctrine. This present doctrine is weighed against

Class Profile: 1956

Total students: 890

Category:

Regular Air Force	428	Marines	12
Active Reserve Air Force	351	Navy	5
Reserve Air Force	15	Air National Guard	13
Army	15	Allied	51

Rank (active duty Air Force): 578 majors, 204 lieutenant colonels

Length of service: average 12 years

Age: average 36-37

Status (active duty Air Force): 634 rated, 148 non-rated

Flying time: 2,300,000 hours (206,000 combat hours)

Awards and decorations:

Distinguished Service Cross	8	Bronze Star Medal	129
Silver Star	55	Air Medal	2806
Legion of Merit	16	Commendation Ribbon	215
Distinguished Flying Cross	555	Purple Heart	87
Soldiers Medal	15	Foreign decorations	139

world conditions, the U.S. national objectives, and the USAF capabilities to achieve these national objectives, using the present doctrine. Any proposed changes in the USAF manuals are studied and analyzed by the Command and Staff School students. A recent example was the assistance given in the rewriting of AFM 1-2, USAF Basic Doctrine. Here again, while the USAF officer gains something in knowledge of what constitutes basic Air Force doctrine, he is also helping the Air Force and the Department of Defense to achieve the Air Force mission and the objectives of the United States through a better and more effective use of air power in present world conditions.

As they slipped out of the seminar room and shut the door on the heated discussion, Mike glanced at his watch and motioned toward the stairs leading down to the auditorium. "It's about time to point with pride and view with alarm for dear old USAFE."

"Yes, you'd better get on your horse," Jerry agreed. "I'm sorry your visit is so short. If you didn't have to take off right after your briefing, I'd like to

get beneath this broad-brush treatment and show you the fine points of how the school really operates."

"I've absorbed about all I can in one dose," Mike grinned. "Seriously though, I'm darn glad I took this quick tour. I'll buy your main pitch. The students are here for three very good and logical reasons: to improve their ability to act as commanders and as staff officers; to learn and practice the use of background information and doctrine so that they can do a job of planning or operating air forces anywhere in the world and under all different kinds of ground rules from peace through cold war to total war; and, finally, to tackle the business of getting across what they have to say in an effective and convincing way, either in speaking or in writing."

"That about sums it up," Jerry agreed. "Glad your homework made such an impression."

"That it has, my boy. In fact I must admit—look at the clock, gotta run. Thanks for everything, Jerry. If I don't get a chance to see you before I leave, I'll call before we take off."

HELLO, Jerry? This is Mike. . . . Yeah, I'm all filed and ready to fly. Hope we didn't disgrace you with the briefing. . . . Well, thanks. Of course I don't know what else you can say. . . . It's been swell seeing you too. I feel as though I have learned a lot. I've certainly got a lot of respect for your graduates now. . . . Thanks for looking after me, and tell Mary I really meant it when I told her this morning she's the world's best cook. About this school, do me a favor, will you? Rustle up a new application blank and send it to me in Wiesbaden. Okay? . . . See you."

Air University Quarterly Review

Books and Ideas...

The Air University Quarterly Review: An Essay in Intellectualism

LIEUTENANT COLONEL KENNETH F. GANTZ

WHEN shortly before the Second World War I went to Texas to profess in its University, I discovered a phenomenon odd, for a brief time, to me. In fact as I stood new in the breach of my onslaught, it was not without its humor.

During my earlier days in Indiana and Chicago I had never heard any one called an Indianian or an Illinoisan, or anyone actually refer to himself as a Hoosier, such a term apparently passing only in the currency of journalists. But everyone who lived in this new world was a Texan, written all in capital letters, and quick to tell you. All had uniformly put place of birth aside as an irrelevance of uncontrollable chance, unless the nativity had been within Lone Star boundaries. All citizens, indigenous or adoptive, breathed in Texas air alike, and alike they breathed it out.

This parental amalgamation and communal infusion of filial pride did not long remain noticeable to me. At the beginning of my second year I was heard to drop a few remarks among the newest newcomers to the University staff about their good fortune in taking up residence in a favored land. Maybe most of us Texans were not native to the place, but we were Texans by choice.

As one who has since had the good fortune to live many years in the Air Force, I can testify to parallels. One is the high population of the Air Force by Airmen. Capitalized Airmen don't just belong. They are imbued with a common airmanity. You might say they are actively motivated by a conceptual air power, as well as belonging to a physical one. Another parallel is a certain largeness of view. I would not myself confuse this with geographical range, extended as are the frontiers. For my money it is not the evident concern with techniques of airmanship and tactics of the employment of air forces. Rather it is a substantial awareness that clothes these more immediate concerns with the potential impact of air force in shaping the world of today.

If there is a quickly identifying trait of this airmanity and its viewpoint, I would call it intense professionalism. Bump into your Airman and instead of "pardon me," there will ensue a conversation about air force. For the most part, two categories of topic range up and down the officers' messes. One is "Life in the Air Force." The other, and the commoner, is "Air Power." This thing goes all the way back to the Wright brothers, one of whom early wrote at some length on the advantages of the airplane over the dirigible.

While I have indulged these surface indications of professional interest with hyperbole, they essentially square to the strong intellectualism that has sparked the traditional fervency of the airman. After the hefty, if not too widely appreciated, imprint the airplane left on World War I, this intellectualism soared immediately. Among the enthusiasts of the Air Service there was an impressive penetration beyond the technical problems of flying and fighting the airplane, yet at no more than a fair beginning of solution, to the larger considerations of national defense and military statesmanship. The General Billy Mitchell episodes of the 1920's were no more than sign and symbol of the doctrinal thinking of a sizable college of aerophilosophes, who soon founded the Air Corps Tactical School to extend it and promulgate it. Here while the Thirties ran toward the drains and the growing shadow of the Luftwaffe frightened half of Europe, the ideas were hammered fine and the devices brought into compass for the transcendent American air power of World War II.

In 1941 the ideas became urgent and tangible. On 9 July President Roosevelt asked General Arnold for the logistical data to implement American air doctrine. During a few hot and hasty days a handful of fellows of the college, then in the Plans Division of the Army Air Forces staff, composed the famous AWPD/1, "Munition Requirements of the AAF for the Defeat of our Potential Enemies," a remarkably accurate blueprint for the European phase of the air war that ensued. The doctrine itself had been ready and waiting.

We should find little to wonder that one of the early acts of Airmen in the reshuffling after the war was establishment of an organized focal point for doctrinal planning and for thoughtful preparation in staff and command of air operations. The founding of Air University and its broad program for professional development is a monument to the great tide of intellectual conviction that welled throughout the postwar Air Force, the ultimate bearing of which on the Nation came in the so-called "New Look" at defense affairs in 1953 and after. Again the doctrine and its channels for tangible expression had been readied and were in waiting.

In another aspect Air University is a focal point for the flexibility and the forward-looking quality of Air Force intellectualism. From its first days the Universiy was to be no pundit college of war, conning the operations of the past and offering school solutions for the future. Its professional schools have very substantially been *collegia* of officer scholars, senior and junior. Prepared by the discipline of personal experience, those in attendance have been temporarily banded together to instruct themselves by attacking the current problems of air operations for actual solution and examining the entire frame of reference in which the problems must be solved. Their concerns range from the staff and command tasks of committing a wing to the political implications of the Hungarian revolt. Their accustomed method is the seminar, combining the knowledge and expertise of instructor and students. The result has been a marching application of Air Force experience to the planning and devising of operations on all levels from the squadron to major command and a continuing re-examination of the theory we call doctrine.

In the first months following the activation of Air University the attention of its new Commanding General, Muir S. Fairchild, turned to the establishment of a periodical journal to assist in gathering and making available the experience and opinions of informed persons concerning air strategy, tactics, and techniques and other topics of significant relevance. It was his wish that publication begin before the close of the first academic year.

The new journal was planned to be no parochial reflection of internal Air University interests and events. Although measuring up to the highest academic and professional standards of Air University, it was not to be, per se, an instructional device in writing or a favored outlet for Air University papers or ideas. The history of the preliminary planning indicates that General Fairchild had in mind a forward-looking journal of air power for the interchange of mature thought and the dissemination of advanced information. It was in this editorial identification with the current of Air Force intellectualism that the journal would bear relationship to its parent University rather than in any priority for Air University authors or ideas. General Fairchild hoped that from the first its content might be considered of national and international significance.

On 27 February 1947 General Fairchild posted a memorandum establishing the *Air University Quarterly Review*. The standards were high:

> This journal of Air Power will not be just another news-magazine, nor is it intended as a periodical of interest only to the Air University. Rather, it will be a professional publication in the highest sense of the word and will reflect not only the high scholastic standards and educational accomplishments of the Air University, but also—and more important, perhaps—the best professional thought concerning global concepts and doctrines of air strategy and tactics.
>
> Thus, in certain respects, the AIR UNIVERSITY QUARTERLY REVIEW will be an extension of the concepts and doctrines developed at the Air University and which underlie its program of instruction. Articles published in the journal will be confined to subjects related generally to Air Power and its application, and appropriate emphasis will be placed upon the trends of technological development and their indicated effects on military aviation of the future.

The first issue, Volume I, Number 1, was published in May.

From the beginning the *Quarterly Review* has been a journal of opinion. General Fairchild's initial instruction to his staff was emphatic on editorial policy permitting the controversial: "No restrictions will be imposed on the articles selected except that quality and pertinence must be sufficient, as long as compliance with existing regulations is assured." The directive on the Editors was clear. The *Quarterly Review* was not to be another of the military journals that parrot only existing doctrine and current official views. That role might well be necessary for the periodical conceived to satisfy certain needs of military instruction and guidance. But this one was to be another thing and to partake of another kind of purpose. The mission to dispense professional information and interpret doctrinal and policy matters was an important part of the charter, but equally important was the forum to offer amending opinions or flatly to disagree.

In the first weeks of publication General Rosy O'Donnell, then the Air Force's Director of Information, assured General Fairchild of his complete agreement that the *Quarterly Review* should provide for its authors to express original thought even though it might not accord with existing official concepts. In the belief that this principle of the forum was good and a benefit

to the service, succeeding commanders of Air University have strongly endorsed it, and it has had the continuing support of high office in the Air Force. It is in the intellectual tradition of our service to believe that existing concepts and operating procedure are subject to the seasoning test of intelligent critique.

With the privilege of discussion came responsibility. It could not be contemplated that projectional thinking would run wild with fancy or that the doctrines and institutions of the Air Force should be challenged on mere personal bias or critiqued from little knowledge and slight experience. Nor was technical statement, analysis, or description to go into the book unexamined for adequacy and competency.

To guide the Editor in choosing and reviewing the broad range of content presumed by Air Force interests, an Editorial Board was created of very senior officers highly placed in the Air University hierarchy. Appointed by the Commander, Air University, the Board is directly responsible to him for the governance of the *Quarterly Review* and the quality of its content. Through the Board, editorial policies and programs are guided by the mission of the United States Air Force and ensured of due regard for the doctrines of air power and the Air Force concept of application.

Each item tentatively selected for the content of an issue is submitted to the Director of Information Services, Department of the Air Force, and the Security Review Branch in the Office of the Secretary of Defense, and publication does not proceed until it is approved with regard to security and policies governing release of information (AF Regulation 190-12). The *Quarterly* bears within its covers a disclaimer, that its contents reflect the opinions of its authors or the investigations and conclusions of its Editors and are not to be construed as carrying any official sanction of the Department of the Air Force or of Air University. It is nevertheless published by the Air Force and identified in its entirety with Air Force interests. By and large its sources of information are subject to the presumption of official accuracy and authenticity. The need for exacting security review is obvious. The utterances of its Air Force authors are rightfully subject to the considerations of good taste and propriety that are imposed on all their public statements by Air Force Regulation 190-6. A limit is equally apparent to the leeway they may be permitted in publicly criticizing national or international policy and programs beyond their authority or responsibility to amend. The editing of the work of non-Air Force authors is guided by the same provisions.

Actually the established canons of the Department of Defense bearing on the latitude of statement in the *Quarterly* are few, sensible, and, if precisely applied, not at all onerous. They are principally concerned with public pronouncements on political, diplomatic, and legislative matters, with criticism of members of the U.S. Government, with interservice controversy, and with obstruction of the defense missions. None of our authors would wish to embarrass the Air Force or the Government, or hinder either in attaining its aims. Yet few of our authors or editors are intimately familiar with all the implications for current circumstance that may possibly be found to proceed from even what may seem to be a straightaway conclusion drawn from simple fact. Hence the double assurance of official review. This review

frequently embodies the guidance of Hq USAF staff sections or Air Force commands with primary interest in the subject concerned, of other Department of Defense agencies, or of the State Department.

THE *Quarterly Review* did not escape the growing pains that affect new ventures. It had its operational trials with the procurement of content, with staffing, and with format.

The earliest issues were filled principally with matter originating in Air University's instructional program, article versions of distinguished guest lectures and suitable theses. Classification ran a heavy interference here. After the first issue the Commanding General laid a requirement on each Air University instructor to write an article a year for possible publication in the *Review*. Although many fine pieces were obtained and published during these first years of publication and the journal did not actually want for usable content, the cupboard was chronically bare beyond the needs of the immediate issue in preparation.

When incident to assignment rotation a new Editor arrived in the summer of 1949, the file cupboard was quite bare of material actually in hand for the next issue. The instruction of the President of the Editorial Board was to push forward the development of a first-class journal of air power, ably begun by the two preceding editors. In addition to the procurement of content these editors had contended successfully with establishment of working policies and procedures of format, printing, clearance, distribution, and the sizable and time-consuming detail of putting a new periodical into continuing production. These mechanics in hand, it was now possible to channel a larger portion of editorial energy to the procurement of content.

The core of the problem quite apparently lay in enhancing the reputation and prestige of the journal throughout the Air Force and among those concerned with air power. Awareness of the journal itself and esteem for its content were the magnets that might be expected to inspire significant contributions in greater volume. Such renown was not to be obtained overnight. Years of steady accrual would be needed to turn the trick. Two or three, it was hoped, would bring a substantial advance.

The requirement on Air University staff members for contributions was scrapped, as was the preliminary planning for a small honorarium. Neither method of accumulation seemed likely to stimulate the broad, quality coverage the *Review* really wanted. Invitation and professional satisfaction seemed better method and more appropriate remuneration. Prospective authors of eminent authority should not be approached with an accompanying offer of payment—in fact, could not be, in high official positions. Then there was the matter of the intellectual tradition. The *Quarterly* should pride itself upon publishing what ought to be said. For it the road to superiority did not begin at the cash register but in the degree of skill displayed by the editors at interesting the intellectual and professional bent of prospective authors.

Accordingly a plan was initiated to depend upon the editorially conceived article and selection of an appropriate author to write it. The editors

would choose specific topics from the various areas of desired coverage and invite persons of experience and authority to write them in accord with or in reaction to a suggested development. Above all, the editor would get out from behind his desk and seek out his ideas and his writers, in the time-tried practice of his profession. What he could discover and what commitments he brought back to the desk would be his meat and bread. Excursions abroad might also be expected to stimulate unsolicited proposals and contributions, which, as always, would be genuinely welcomed additions to the diet.

The "invitational method" has continued to be one of the mainstays of the *Quarterly Review* program, into which it has introduced many of the substantial names of the Air Force. Now, as in the early days of the *Quarterly,* articles of top-drawer interest and authority are hard to come by. No editor of any publication ever had enough of them. A sizable sum of investigation and staff work must underlie discovery and working up of adequate proposals. But the confidence in the Air Force tradition of intellectualism was not unfounded. No invitations have been refused for other reason than a practical difficulty the editors did not forecast, and these refusals have been very few.

With a military journal published by the service the methodology of content is inextricably bound up with clearance procedure. The professionally advanced articles intended for the *Quarterly* frequently pushed, by their very nature, into regions of disagreement concerning, for example, the evaluation of weapons, tactics, and techniques or the interpretation of situations and events. Considering the numerous experts to be consulted, complications inevitably arose.

A material clarification of the scope of professional examination and discussion in the *Quarterly* was achieved in 1950. General Kenney, then Commanding General of Air University, became concerned that competent professional critique not be unduly restricted by mere disagreement or contrary views on the part of various agencies consulted during processes of security and policy clearance. Major General John DeF. Barker, General Kenney's deputy, and Brigadier General Sory Smith, Director of Public Relations, formulated a memorandum on "Review Policies for the Air University Quarterly Review" (28 July 1950). This document, which reaffirmed that "the editorial policy of the *Quarterly Review* will provide for the widest latitude in professional opinions on matters significant to air power," so illumines the scope and approach of the journal in certain areas for prospective authors that its core should be quoted in full.

> 3. While the editorial policy of the *Quarterly Review* will permit the expression of points of view, opinions, and ideas which do not conform with official Air Force, Department of Defense, or national policies, plans, or operations, it will ensure that such presentations are in good taste, are constructive, are sufficiently logical, and are developed on a high professional plane. For example, material having to do with subjects which have become identified in the public mind as "Service controversies" should present a point of view, not in specific terms of the controversy itself, but through a constructive treatment of the technical issues involved.
>
> 4. Editorial treatment of subjects in the following categories is also presumed to be generally within the scope of the *Quarterly Review,* subject to the general provisions of paragraph 3 and to such specific limitations as may be prescribed below:
>
> a. *The presumed intentions and interpretations of the actions of foreign governments:* While subject matter in this category must be given consideration in studies pertaining to national security or the development and employment of air power and

therefore constitutes a proper element for the contemplation of professional opinion, such presentations should limit discussion of these intentions or actions to their bearing on the primary mission of the *Review* [defined as "the publication of studies pertaining to the national security, the nature and development of air power, and its uses, strategy, tactics, and techniques."]

b. *Examination of existing official plans, policies and operations in the Air Force, in other services and in other branches of Government:* The direction and employment of air power, its bearing on national security, its strategies, tactics, and techniques, its needs in personnel and materiel, are proper matters for the expression of professional opinion. The proper development of this subject may involve the examination of existing official policies, plans, and operations in the Air Force, in other Services, and in other branches of the Government. Views on these matters are properly within the scope of the *Quarterly Review* as they relate directly to national security or the development of air power—provided they conform to the criteria set forth in paragraph 3.

c. *The examination of weapons and weapons systems:* This subject is a primary topic of professional discussion that involves examination of competitive weapons systems and weapons and proposals for the conduct of warfare that have a bearing on the employment of air power. Consideration of the effectiveness of the employment of elements of air power by the various services, or of proposed substitutions for air power, or of modification of its employment through the introduction of other types of weapons systems, is within the scope of professional criticism. The criteria outlined in paragraph 3 should apply to the review and consideration of materials in this category.

The outbreak of the Korean War sparked a pronounced extension of *Quarterly Review* coverage and methods. Editorial interests swung from long-range prognosis and the broader themes of air power to analysis and interpretation of the eventful present. A substantial amount of reportage also came into succeeding pages, in the form of analysis of the conduct of the air war in progress. The Editors hoped to make available more technical examinations of the hostilities, particularly with reference to air doctrine, than are customary in the public press. As much as possible these examinations would be composed by principals and key personnel involved in the actions treated. Never out of mind was the valuable accumulation that might result of what the historians call "primary matter," recording firsthand knowledge and experience.

To extend the Korean coverage, the editorial staff soon began itself to compile and write up staff studies, notes, picture stories, and commentaries, based on documents, interviews, and the direct technical assistance of Far East Air Forces commands and staff agencies. Editors made three visits to Japan and Korea for on-the-spot contacts and commitments in 1951, 1952, and 1953. With the Fall 1950 issue the *Quarterly* adopted a layout of generous illustration, to accommodate desirable maps, charts, and photographs. Soon these were being augmented by graphic presentation of key concepts and abstractions relevant to the text.

All in all, from 1950 to 1954 the *Quarterly* published some thirty full articles and numerous shorter pieces on the Korean air war.

One final incident should be related in the development of contentual structure, as it resulted in a definition of the maturing *Quarterly's* outlook upon the case for air power. Shortly after General Kuter assumed command of Air University, *Air Force Times* editorialized on "The Review Is Older Now,"* noting with "sentimental sadness" a change from fullness of "career *joie de vivre*," expounded with the buoyant youthful enthusiasm of "embryonic Douhet's and de Seversky's," to "politically mature presentation." The aging was attributed to restrictions gradually imposed by official publication. In a letter of reply General Kuter wrote:

**Air Force Times*, 9 May 1953.

> We join you in occasional regret that the Quarterly has grown from youthful enthusiasm to less venturesome conservatism, and from time to time wistfully look back on the earlier, more free wheeling days, but perhaps not with your degree of nostalgia . . .
>
> The last sentence of your editorial gets to the heart of the problem faced by any formal military publication: "How to deal with the controversial without setting the hounds of controversy baying." This has sweeping implications. Almost any subject of interest to the Air Force can become controversial. The Quarterly Review has always been eager to accept controversial articles, but it also feels that the case for air power is now strong enough to stand on its own feet. To attempt its promotion by reckless expounding of "youthful thought" would gain us little and might lose much. Rather, if we present the facts convincingly as we can, we will usually have enough grounds for whatever conjectures we wish to make. With this as deliberate editorial policy, we have increasingly required of our authors factual accuracy and objective thinking.
>
> Why should any potential Douhet or Seversky be discouraged if we ask only that his vision of the future have its roots in solid fact? In other words, the Quarterly Review tries to distinguish between pointless controversy or unsupported conjecture and considered opinion. We will continue to welcome fresh and stimulating viewpoints. Writings of genuine vision are rare and precious. When we find an article of bold vision which has its basis in fact, it will be published.*

From Fairchild, first builder of Air University, through Kenney, bold improviser of the South Pacific, to Kuter, coauthor of AWPD/1, all three were knitting intellectual purpose and inspiration into the idea of the *Quarterly Review*. All three were fellows of the old Air Corps Tactical School. There in 1935 General Harold Lee George, then a major and director of the Department of Air Tactics and Strategy, had explained the school problem to the students. In a larger sense he was talking about intellectual motivation.

> From today on much that we shall study will require us to start with nothing more than an acknowledged truth and then attempt, by the utilization of common sense and logic, to evolve a formula which we believe will stand up under the crucial test of actual conditions. We shall attempt to develop logically, the role of air power in future war, in the next war. We are not concerned with fighting the past war;—that was done 18 years ago. We are concerned, however, in determining how air power shall be employed in the next war and what constitutes the principles governing its employment, not by journeying into the hinterlands of wild imaginings but by traveling the highway of common sense and logic.**

It was this familiar spirit, rising through the Twenties and the Thirties and taking on form world-wide in the Forties, that guided Fairchild, Kenney, and Kuter, commanding Air University, as they shaped their school. It was the familiar intellectual spirit of the Air Force they had plainly in mind when from time to time they spoke out to guide the *Quarterly Review*.

KNUT HAMSUN opens his great novel *Growth of the Soil* with a pioneer, a barge of a man, walking alone into Norway's virgin northlands, carrying what he could on his back. Long miles north of the last habitation he came to a place. Methodically he paced over the lush meadow grass of the valley. Now and then he stopped to crumble some of the soil through his fingers. He noted the stands of trees and the shelter from the winter wind. He sought out the fresh water. Finally he stood and looked around him for a long time.

The story was about how he made out. Everyone knows the outline of a pioneer novel. How he built a shack and broke the land, now and then carrying in more tools, acquiring cows by design and a wife by chance, until after all his troubles and before he knew it he was a patriarch surrounded by

**Air Force Times*, 6 June 1953.

**Air Corps Tactical School Lecture, "An Inquiry into the Subject of 'War,'" 1935, quoted in USAF Historical Studies: No. 100, *History of the Air Corps Tactical School*, 1920-1940 (Air University: Research Studies Institute, 1955), p. 28.

rich acres and a community of another generation. With the first ten years in the story of the *Quarterly* drawing to a close, perhaps its readers and prospective authors may find some interest in how the journal has made out. We have seen it come from an intellectual tradition, stake out some good land in the Air Force scheme, have its title regularized and improved, and get a start with the farm. It has by no means converted its stake into full realization of its possibility. Yet it has made something of a reputation in the world of air power, if requests to reprint and other incoming correspondence are tokens. It has attracted many well-known authors, and many not so well known but of excellent merit. It has made important advances in its physical structure, and these are necessary foundations for further increasing of net worth.

The *Quarterly Review* is published with appropriated funds, in its first years for the official use of Air University and since 1952 for official use Air Force-wide. Subscriptions are also sold to individuals in the Air Force and to the public, nationally and internationally, by the Air University Book Department, acting in effect as an agency of the Superintendent of Documents, Government Printing Office. The authorized intent of publication is to inform and stimulate the professional interests of Air Force officers, active and reserve. Also fundamental is the purpose of debate and advancement of the issues of air power.

The formal basis for the official distribution is to assist the Air Force mission. Until the current issue official distribution has been almost entirely in response to official request. Even when addressed outside the Air Force it has been at the request of an Air Force or other Government agency.

Practically all the 2400 copies of Volume I, Number 1, the Spring 1947 issue, were used within Air University. By 1952 requests from non-Air University activities had built up external distribution to exceed the local. As a consequence the *Quarterly* was declared a Department of the Air Force publication, no longer to be printed with Air University funds. Full responsibility for publication remained with Air University, which also supplied all support except actual printing money.

The publication of a periodical with appropriated funds is under the special cognizance of the Bureau of the Budget, as distinguished from other individual items of printing. Each periodical must be separately approved before publication can begin, the method of applying for such approval for a proposed Air Force periodical being set forth in AF Regulation 5-7. Once granted, the approval is good for three years, when application for renewal must be made for a succeeding period of three years. Among other things, such as page size, maximum number of pages per year, and maximum printing cost per year, the Bureau of the Budget approval sets a maximum number of copies that may be printed per issue for official distribution.

The point of these obscure facts is that an official periodical cannot expand its distribution from issue to issue. The maximum that has been allowed is also the minimum number of copies to satisfy the actual distribution that could be justified at the time of the application. If that one is a little hard to crack, here it is again. You will be authorized only the number of copies it takes to cover an actual and existing distribution list proposed

and justified in detail for the first issue after your approval. Expansion is supposed to be taken care of by reapplication, at any time, for amendment to the authority to publish. The catch is that this reapplication is a sizable undertaking, involving the entire procedure of an original application. Its accomplishment is a matter of months, and far from any issue-by-issue kind of doing. The point therefore is that to take on a new "customer" for official distribution, you have to find his copy by curtailing an old customer, until enough stress has accumulated to justify the administrative effort of appeal.

While the Bureau of the Budget limitation on number of copies does not apply to or in any way curtail subscription sales, Air Force and other Government agencies cannot secure copies by this route. The purchase or requisition of officially published periodicals by means of appropriated funds is contrary to the regulations governing the expenditure of such monies.

By 1955 the suspense file of requests for copies and the general demand communicated to the Editors made very plain the gross inadequacy of the 1952 authorization of 6400 copies for official distribution. At the suggestion of the Vice Chief of Staff, to whom the need had been communicated by the Commander, Air University, responsible opinion throughout the Air Force was sampled to find out its regard for the *Quarterly* and the extent of distribution it would recommend.

A questionnaire was dispatched on 15 March 1955 to 94 very senior officers of the USAF in command and staff positions deemed to provide representative coverage of major Air Force organizations. The 80 responses closely approached unanimity in testifying to high value and usefulness of the *Quarterly Review,* to the scantiness of its distribution, and to the desirability of greatly enlarging its usefulness through a set Air Force-wide dissemination. The average ratio indicated by the responses for this dissemination was 1 copy for each 9 Air Force officers. Many special needs were indicated for quantities greater than the proposed general distribution would provide.

As a result of the questionnaire and requests in suspense a total estimated requirement for 32,000 copies was disclosed. This estimate was later amended to 16,900 by Departmental authority. The proposed Air Force-wide ratio was established on a trial basis at 1 to 30 officers, and some special requests for copies were not allowed. On 18 May 1956 the Bureau of the Budget approved the 16,900-copy maximum for official distribution. Funds and the printing contract were adjusted to permit the enlarged distribution, beginning with the Fall 1956 issue.

In conjunction with this action for increased distribution another significant landmark was passed. Although for some years the *Review* had informally filled the Air Force need for a professional journal of air science and tactics, it was officially recognized as such by Hq USAF in 1956 and has since carried the designation and the Air Force seal on its inside front cover. Responsibility for preparation of content and publication remained with Air University. Consideration was given to calling it the *USAF Quarterly,* but the proposal was tabled in favor of the old established name.

In September 1948 a conference was convened at Air University to discuss a proposed foreign officers school. Conference members included Major General Richard E. Nugent, Hq USAF, Brigadier General Charles H.

Caldwell, Air Attaché to Argentina, Brigadier General James W. Spry, Air Attaché to Mexico, and a number of others interested in the plan. A strong recommendation emerged as a by-product to distribute among Latin-American countries a suitable Air Force publication printed in their own languages. It was noted that the U.S. Army's *Military Review* had been very well received in its Spanish-American and Brazilian editions.

The new *Air University Quarterly Review* was nominated as "the most logical publication for this purpose." Approval was given to the project by Hq USAF on 14 January 1949, and Air University was directed to proceed with translation and publication of the *Quarterly Review* in Spanish and Portuguese, subject to the approval of funds in the FY 1950 budget. The USAF Missions in Latin-America were to be the primary agencies for distribution, under jurisdiction of the Caribbean Air Command.

In September 1949 Air University received an independent suggestion from Major General George C. McDonald, Commanding the USAF Section, Joint Brazil–United States Military Commission, to publish the *Quarterly Review* in Portuguese for its "great value as textual material in the Brazilian War College, Command and Staff School, and Air Tactical School," as well as throughout the Brazilian Air Force. About the same time the Editor was notified that the funds to support the original project had been approved. Publication in Spanish and Portuguese began with the Fall 1949 issue, actually issued as back numbers in the following year after contracts for translation and printing had been arranged.

Although the Editor was fortunate in securing the services of a contractor with long experience in translation to topical matter in military aviation, it was apparent even before the beginning that the advanced nature of the content and its conceptual basis would require translation under informed daily supervision. In time Spanish-Portuguese editors and translators of eminent skill and learning were added to the editorial staff, so that the *Quarterly* could do the complete job of its foreign-language editions under its own roof. Great attention is given to full and accurate rendition of technical and conceptual statements and to the idiomatic flavor of the translation. The controlling principle of the general editorship of the foreign-language editions is clear-cut and simple. The Spanish- and Portuguese-language editions will intend to be replicas of the English edition, as it was prepared for USAF professional readers.

The problem of illustrating the basic English edition in close correspondence to the quality of the text was brought under control in the same manner. Since the early 1950's the *Quarterly* has had its own art department to work in elbow-to-elbow association with its editors, writers, and authors. The aim is technically accurate and conceptually precise graphic supplement to the text, imaginatively rendered in fine-art techniques. Most *Quarterly* illustrations are evolved step by step with the worded matter they reinforce. The techniques of black-and-white illustration are being explored in ink line, pencil, wash, screen, and montage, with what is hoped are increasingly distinctive adaptations of fine-arts styles. The idea—to match for *Quarterly* purposes, and where possible to exceed, the effects sought by the wide use of color in contemporary publications. At the same time full super-

vision is exercised by the Editors over the execution of format detail under terms of a printing contract let by the Government Printing Office.

Thus by 1955 the physical structure of the *Quarterly* staff and its standing operating procedures had arrived at a comprehensive grasp and control over the processes of bringing the succeeding issues and their various editions into being. Without going into the history of staffing or of defining, attaining, and preserving standards of performance, perhaps I may be permitted the remark that the trip has had its complications.

THE PRINCIPAL theme of this writing has been the association of the *Quarterly Review* and Air Force intellectualism. Viewing this theme again, we might consider that the *Quarterly* is itself an essay in intellectualism, an attempt to inspire intellectual production in the form of briefer items of professional literature. And in this consideration we can scarcely find a surer way of balancing the *Quarterly's* account than to weigh the substance of the 300-and-more articles forming the contents of its eight published volumes. If we can agree that these articles compose in the main a file of detailed, accurate, authentic, and professionally viewed information and opinion on a wide variety of Air Force and air power concerns, then the mission is proceeding according to order and the essay in Air Force intellectualism is fruitful.

Accord in this agreement must be left for the *Quarterly's* readers, highly competent for the critique. But assuring evidence of the quality of the *Quarterly* in the essay we have assigned it has come in many requests to reprint its articles and in the generous support of many eminent Air Force officers. A particularly gratifying comment was addressed to General Kuter by the Vice Chief of Staff, General Thomas D. White, whose interest in Air Force writing is well known. In referring to the series of articles published by the *Quarterly* on the Korean War, General White termed those he had seen as "outstanding."

Thus the *Quarterly* now has its own tradition. It faces its second decade with its own patterns to build to and extend. It will continue to welcome authors from any association with air power. Certainly its authorship will not be limited to personnel of the USAF. Much desired are pieces analyzing, interpreting, or critiquing current air force operations. The *Quarterly* rarely concerns itself with military history as such, so that the tactics and techniques of the past should be studied for it only as subsidiary to themes of current USAF interest. The *Quarterly* publishes only original material that has not previously been published or made public in such forms as speeches and press releases. It does not deal in spot news in the sense of reporting events, but it does look for technical or other professional interpretation of significant happenings in the world of air power and air forces. It normally excludes news of personalities or reference to them unless essential to the exposition of another subject than themselves. It can use technical articles on topics of broad Air Force interest, written for the reader nontechnical in the subject but professionally interested. And it waits with interest for authoritative pieces

examining air power and its significance in our world of today.

These are exciting times in the Air story and in general military history. The United States Air Force has assumed great stature in the defense of the Nation. As always, it is in the ferment of change. Great new weapon systems are coming into the line. Personnel and organization alike live forward into a diverse future of incredible technical and professional complexity.

Periods of great action and incessant adaptation are fertile for intellectual exercise and for profit without end. The now-blank pages of the *Quarterly's* future editions challenge responsible authorship.

Air University Quarterly Review

The Quarterly Review Contributors

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MAJ. GEN. JOHN D. STEVENSON (USMA) is Director of Plans, Tactical Air Command. Early in World War II he commanded the 22nd Pursuit Squadron. In 1943 he became Commander of the 27th Fighter-Bomber Group in the European Theater. After the war he served as Chief of the Plans Division, Military Air Transport Service, and as Chief of the Atomic Energy Division, Office of the Assistant for Atomic Energy, Hq USAF. From 1952 until his present assignment he was Commander, 49th Air Division, NATO. Born in Laramie, Wyoming, General Stevenson is a graduate of the University of Wyoming. He also graduated from the Air War College in the class of 1948.

COLONEL PRESCOTT M. SPICER (USMA; M.B.A., Harvard University) has been since 1954 Commander of the 67th Tactical Reconnaissance Wing and of Itami Air Base, Japan. He has served two tours in Headquarters USAF, 1945–48 and 1950–53, in Program Monitoring and Programs Division, DCS/Operations. During World War II he was Assistant Chief of Staff, Plans, Twelfth Air Force, Mediterranean Theater, from 1943 to 1945. Colonel Spicer is a 1954 graduate of the Air War College.

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ATTENTION

The *Air University Quarterly Review* is published to stimulate professional thought concerning air strategy, tactics, and related techniques. *Its contents reflect the opinions of its authors or the investigations and conclusions of its Editors and are not to be construed as carrying any official sanction of the Department of the Air Force or of Air University.* Informed contributions are welcomed.