

AIR UNIVERSITY
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FALL 1952

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THE
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AIR UNIVERSITY QUARTERLY REVIEW

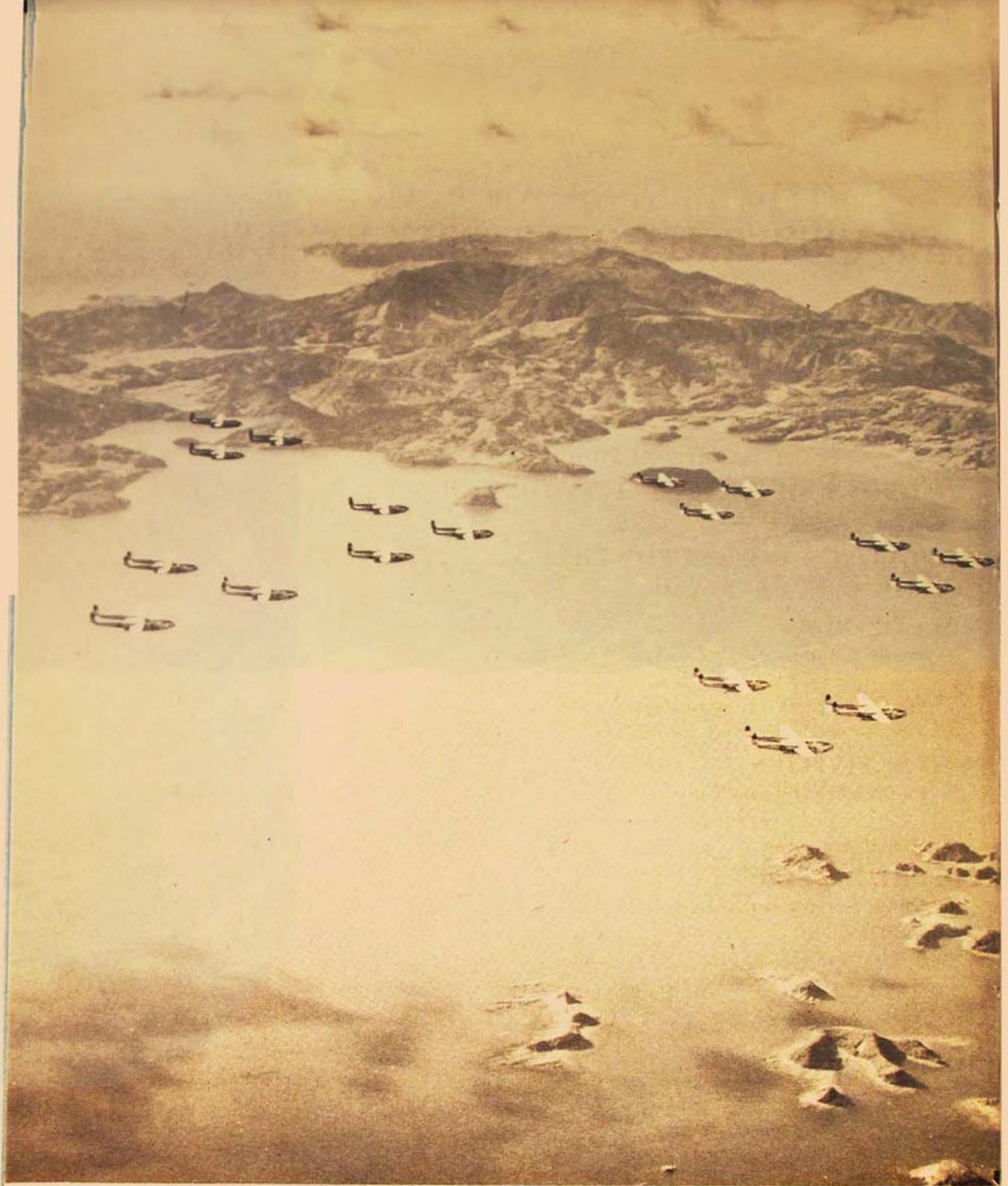
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High over the island approaches to the Korean peninsula this formation of C-119's out-bound from Japan heads for advanced airstrips near the front lines with food and ammunition for United Nations forces. When traditional methods of surface transportation and supply were halted by bombed-out bridges or bogged down in rough, narrow, and muddy Korean roads, land operations became more and more dependent upon airlift for logistical support. Rapid delivery of ammunition, gasoline, rations, and men gave United Nations ground commanders advantages never before available in military operations. As General Tunner points out, past airlifts from the "Hump" to Korea, wherever employed, have been decisive. Yet these have merely scratched the surface of a potential logistical force which, if centrally controlled strategically planned, and properly utilized, can vastly increase our striking power

Technology or Manpower

MAJOR GENERAL WILLIAM H. TUNNER

*For I dipt into the future, far as the human eye could see,
Saw the vision of the world, and all the wonder that would be;
Saw the heavens fill with commerce, argosies of magic sails,
Pilots of the purple twilight, dropping down with costly bales . . .*

THESE lines from Tennyson's classic poem, "Locksley Hall," written nearly a half century before man learned to fly, prophesied a new chapter in transportation history—the air transportation chapter.

Tennyson, peering into the future, was attempting to see the great forests—the big picture—without singling out individual trees. He had more luck than most of us today, who seem to find the individual trees obscuring our vision.

Perhaps the airlifts we have seen in the past decade have been "argosies of magic sails." Yet all of them were born of emergencies as attempted solutions to tough problems usually spawned by an international entanglement with political or military implications or a combination of both. Planners, after vainly seeking the answers in tried and proven means of transportation, reluctantly turned to the airlifts as a last resort.

The Berlin Airlift, despite more recent operations in Korea, remains the best known and most often cited, but it was not the first airlift operation. It was only one of many which have been mounted in different parts of the world by different nations, each motivated by an exceedingly critical circumstance.

The Germans themselves staged several airlifts during the recent war. Two of them were of vital importance and the first was moderately successful. It occurred during the battle for Crete when the British fleet denied surface access to the island. Faced with a formidable concentration of seapower in the sea of Crete and the Aegean Sea, the German Air Transport Force took off from Greece and, protected by its tactical planes, flew to the island and delivered its troops and supplies both by paratroop and airlandings. Although the operation lasted but a few days, it resulted in the capture by the Germans of the strategically situated island of Crete.

The second German airlift operation occurred during the battle of Stalingrad, the city which marked the farthest eastern penetration of the Nazi armies. It was there that the forward German army, commanded by Colonel General von Paulus, was encircled and cut off by the Russians. Hitler frantically convened his air chiefs. Goering,

the Luftwaffe boss, and Milch, air commander on the Russian front, assured him an airlift would solve von Paulus's problems. The German ground general was asking for only a meager 300 tons of supplies a day to hold off the hard-pressing Russians.

Transport aircraft were hastily summoned from the Luftwaffe's far-flung bases. They came from Norway, France, and even Africa where General Rommel was waging his historic desert campaign. But the operation failed—licked by a combination of lack of know-how, bad weather, inadequate winterization of both planes and ground equipment, and the fighting persistence of the Russians.

The failure of the Germans to deliver a scant 300 tons of supplies a day enabled the Russians to kill or capture von Paulus's army of 330,000 men. That was the turning point of World War II. History will look at it as one of the decisive battles of the ages.

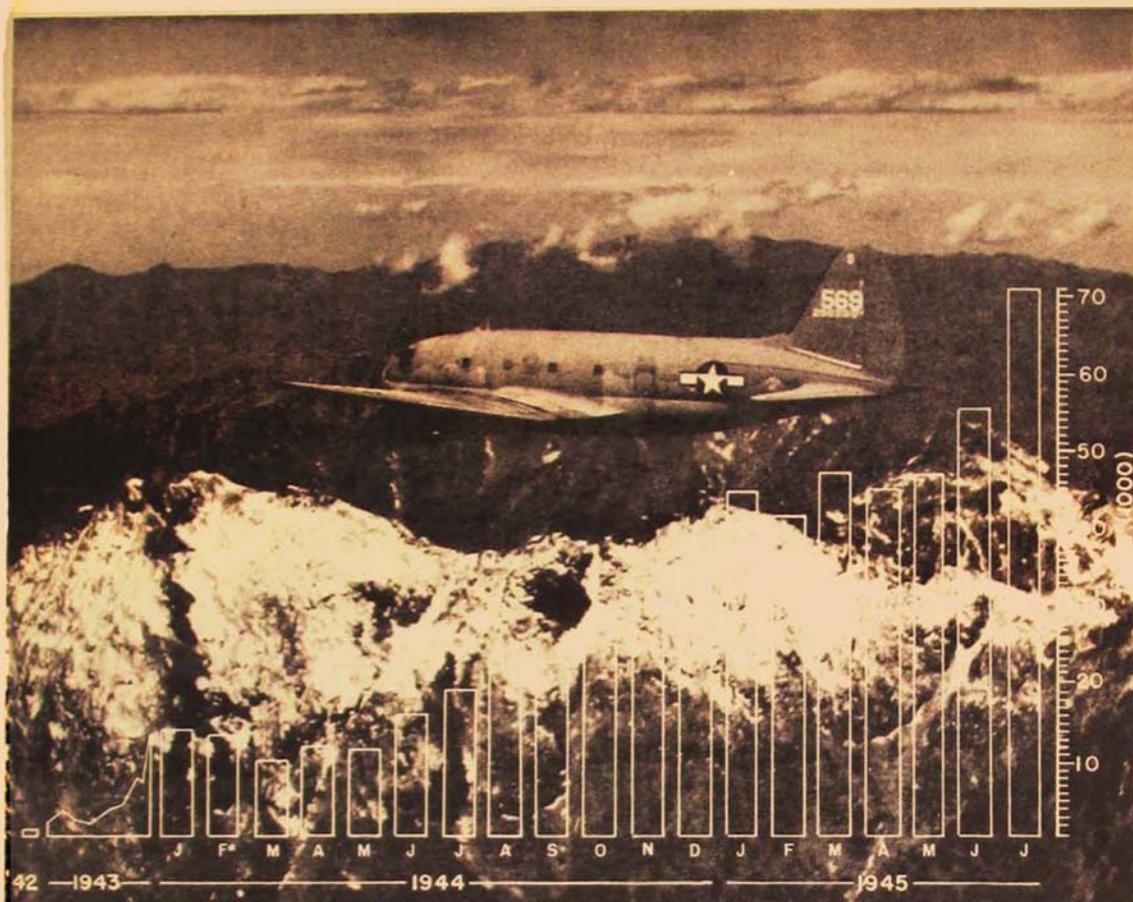
It was during this same period that the first well-known American airlift developed in China. The Japanese blockade and occupation of cities along the China coast denied surface supply routes to the Chinese and our forces engaged in operations in China. On the Burma side the Japanese had infiltrated the high mountain areas and cut the vaunted Burma Road.

An airlift from India over the treacherous Himalaya Mountains to western China was the only way to keep China in the war. And it was necessary to keep the Chinese fighting because they were forcing the Japanese war lords to tie up a million men to protect their conquered Chinese granary and source of basic supplies. Without the resistance of the airlift-supplied Chinese, these Japanese forces would have been free to move to the southwest Pacific to further complicate MacArthur's problems.

This airlift, commonly known as the HUMP Operation, kept the Chinese going and the Allied forces grew to the extent that, instead of taking troops out of China, the Japanese were compelled to draw reinforcements for their mainland operations from their Pacific island forces.

Here certainly was the supreme test of the capability of air transport. No more difficult supply route could be found anywhere in the world. Over these Alps of the Orient we were committed to supply by air our forces and those of our allies under all conditions which make for hazardous flight: fog, heavy rain, ice storms, thunderstorms, high mountains and the necessity for the use of oxygen, uncharted terrain, heavy loads, sluggish planes, faulty radio reception, half-hostile natives, jungles, and one-way airfields in mountainous country at high altitudes.

During the last year of the HUMP Operation, 550,000 tons of every



The first important American airlift took place during World War II over the treacherous Himalaya mountains between China and India. No more hazardous flight conditions could have been encountered anywhere in the world, yet the success of this operation is borne out by the tonnage chart figures. During the last year of the "Hump" airlift four Chinese armies and all the implements of modern warfare, totaling 550,000 tons, were flown into China. During the peak month of operations on the recaptured Burma Road, 6,000 tons of supplies were delivered by surface transportation. In that same month 71,000 tons were delivered by air. The "Hump" airlift had written a startling new chapter in military logistics operations.

type of cargo went into China: four Chinese armies, mail, ammunition, bombs, tractors, 6 by 6 trucks, money, pipe, gasoline, howitzers, horses, and rock crushers. All the instruments of modern warfare were supplied by air.

The last full month, July 1945, saw a total of 71,000 tons airlifted into China by some 650 assorted aircraft, including many of the twin-engined C-47 variety.

This test proved to all of us who were engaged in the operation, and to those on the receiving end, the unlimited potential and dependability of mass movement of men and matériel by air. The most convincing proof of what could be done was shown in one day—1 August 1945—when 5,327 tons of cargo were carried across the HUMP in 1,100 trips averaging a two-way distance of 1,500 miles.

In 1942 the Burma Road looked awfully important to us. So highly was it regarded that whole campaigns were fought to retain possession of it. When it was severed by the Japanese, the loss was considered a major disaster. Yet, during its best days, which came after its recapture a few months before the Japanese surrender, it facilitated delivery of only 6,000 net tons of cargo in 1 month—6,000 net tons in the Burma Road's best month. By air, during the same month, we delivered 71,000 tons!

It was this experience that made military men so conscious of the tremendous potential in air transport. We knew what could be done. We knew we had developed a machine that could do the job. We had acquired the equipment and the trained personnel. Our pilots who flew in "the purple twilight" or any other hour of the day could "drop down with costly bales" anywhere in the world at any time!

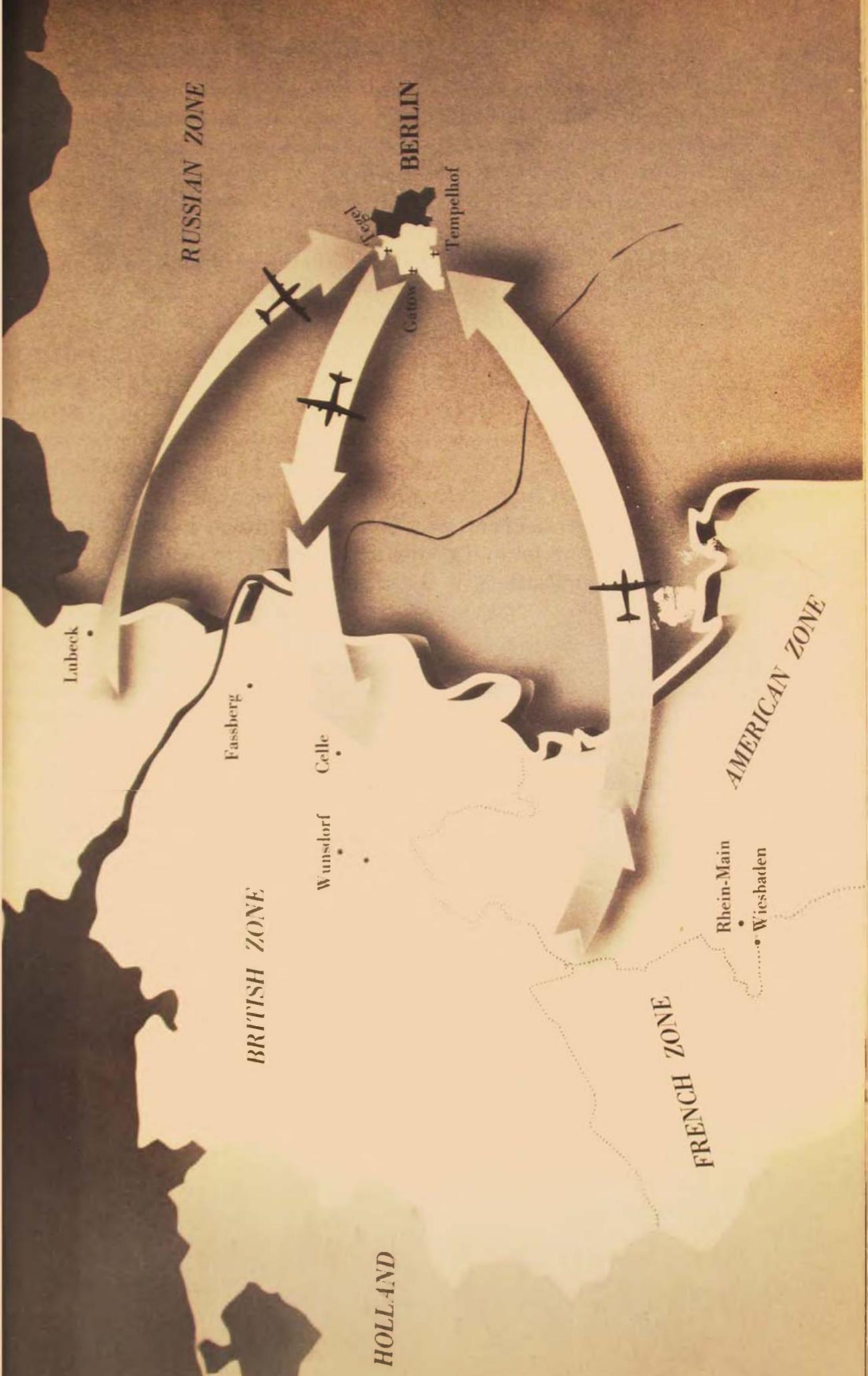
Immediately after World War II and until the summer of 1948, the course of international politics in Europe spread gloom over the free portion of the Continent, including Western Germany. Nothing in an economic or political way seemed to be working. We Americans were pouring vast sums of money into the Continent, but our sincerity was questioned. We were known to be willing to contribute money but the big question was, "Would America go farther?" Were we only willing to pick up the check while someone else dirtied his hands in the in-fighting? And further, were we able, after our scandalously rapid demobilization, to do a physical job in addition to doling out money?

Faced with the threat of a blockade, our leaders still refused to leave Berlin. The Communists thought we were bluffing; they believed they had us cornered, and determined to call our bluff. Their own military history had produced nothing to indicate a gigantic airlift might solve our problem.

Here, as in China, the experience gained in the HUMP Operation paid dividends. Our military leaders who had witnessed the HUMP Operation argued that Berlin could be sustained by air and that the three Allies—Britain, France, and the United States—had sufficient men, equipment, and experience to assure the success of another grand airlift.

In a matter of days after the decision was reached to remain in Berlin, the United States Air Force in Europe roared into action with its available C-47's. One month later, with squadrons of C-54's converging on Germany from wherever our air units were located throughout the world, the Berlin Airlift, as the world came to know it, was in being.

The basic concept of the lift was to pace the entire procedure to a



RUSSIAN ZONE

BERLIN

AMERICAN ZONE

BRITISH ZONE

FRENCH ZONE

HOLLAND

Lubeck

Fassberg

Celle

Wunsdorf

Rhein-Main

Wiesbaden

Tege

Cottow

Tempelhof

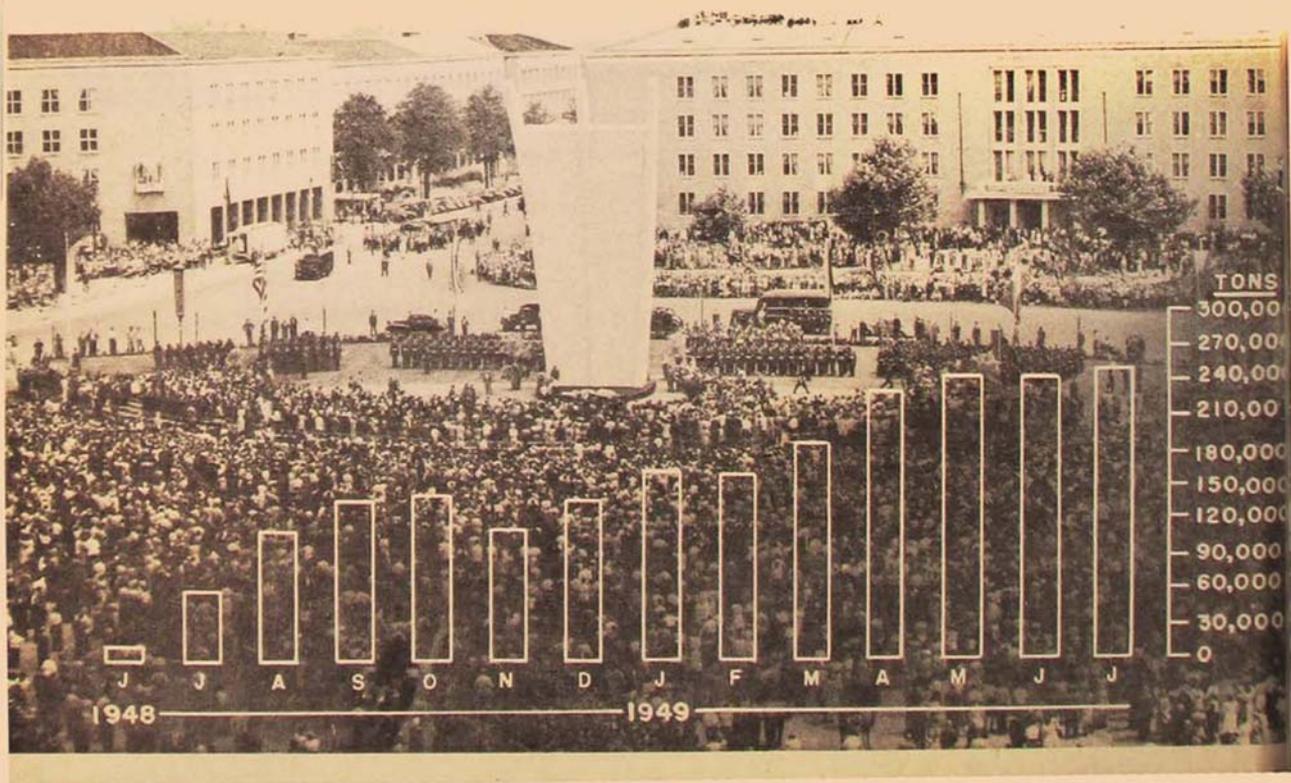


steady, even rhythm with hundreds of planes doing exactly the same thing every hour, day and night, at the same persistent beat. The results indicated the soundness of this concept. In the final 4 months of the operation, 900 round trips every 24 hours were made into the city of Berlin, delivering each day 8,000 tons of coal, food, and other supplies. Easter of 1949 was the record of all record days, when 1,400 plane loads were landed at three Berlin airdromes in an unceasing stream carrying nearly 13,000 tons of coal. That day planes landed or took off from Berlin at the rate of one every 32 seconds.

In each of our airlifts we have capitalized on experience gained from those which preceded. The Berlin Airlift was tried only because we had leaders who had witnessed the HUMP Operation. "Exercise Swarmer" quickly followed the Berlin Airlift. It was the first occasion in our military history when in peacetime a major combat exercise was planned from the beginning as a positive exploitation of the potentials of strategic airlift. The Berlin lift had pointed the way.

New solutions for integration of troop carrier and scheduled air transport organizations in a battle area situation were evolved in

Thousands of West Berliners jam the Lufbrake Platz outside Tempelhof Airdrome to dedicate the German-sponsored Berlin Airlift Memorial. This ceremony was recognition that the failure of Communist surface blockade to drive the Western Allies from the German capital was a major Communist defeat and a turning point in the cold war. The monthly tonnages delivered to the three airfields in Western Berlin from June 1948 through July 1949 are shown here. They indicate the unlimited potential of airlift for large-scale, sustained resupply of a large modern city.



“Swarmer.” It was also here that systematic air evacuation was first considered in the initial planning of a large combat maneuver.

The dust had scarcely settled on the runways of “Exercise Swarmer” when the fighting began in Korea. This called for a new airlift across the Pacific and for the creation of the FEAF Combat Cargo Command with its two elements of air transportation—the combination of airdrop and airlift operations. Here in Combat Cargo the training which the staffs and crews received in “Swarmer” paid real dividends.

Combat Cargo’s mission was to supply the Army, Air Force, and Marines as the fighting surged up and down the Korean peninsula. And, as the Eighth Army moved from Seoul toward the Yalu River in the fall of 1950, the world witnessed for the first time the supply of an advancing army by air transport alone.

The speed of the advance of the Eighth Army was determined entirely by the availability of three vital commodities: ammunition, gasoline, and rations. Korea’s bombed-out bridges and rough, narrow, muddy roads could not handle the stream of supplies necessary to sustain a modern army. The advance was geared to air supply, to be followed up, if possible, with ground supply.

Rations flown directly from Japan are being welcomed at this advance airstrip in North Korea. Rapid mass airlift of food, ammunition, gasoline, and equipment to forward areas enabled numerically inferior United Nations forces first to hold Communist ground forces and, in the fall of 1950, to drive them back to the Yalu.





Two surface transportation bottlenecks in Korea are shown here. The bridges shown above were the only allied bridges spanning the vital Han River during the 1950 United Nations offensive. The supply ships shown below lie off the mud flats of Inchon, waiting for high tide. Any sizable air opposition could have cut off almost all surface logistics at these points. Even with no enemy aerial interference, the advance of the Eighth Army had to be geared for the most part to aerial resupply.



Airlifts across the Pacific and in Korea are operating today. While the battle lines of our forces and the Communists are more or less stabilized, emergencies still arise. Supplies grow short and are replaced by air as they are required; the wounded are being evacuated by air; and more and more battle-weary troops are being rotated by air.

And so it has become a fact that one airlift begets another. This means our experience, techniques, and development of transport aircraft must necessarily grow and, as these grow, the world's acceptance of air transportation also expands.

The dependence of ground forces upon air forces becomes stronger with each new military operation. One Army Corps commander declared, "The airlift to Korea is one of the greatest developments of this war. It gives the commander advantages he never had in wars before. . . . And they are just beginning to scratch the surface of what they eventually are going to do."

When Lt. Gen. Sir Frederick E. Morgan's COSSAC* staff in World War II planned Operation Overlord (the Normandy landings), their most perplexing problem was how to transport and land sufficient troops in a narrow area to take and hold a beachhead. So strong were the German defenses on the French and Dutch coasts that it was readily apparent any area for surface landings would be very limited.

The United States Army's official history of the planning tells how, early in 1943, the COSSAC staff searched for a solution for the landing problem, but in all their studies there is no indication that an airlift was ever seriously considered as the primary means of logistic support. They jealously held to surface transportation, yet they were forced to mold their plans around untried types of amphibious landing craft which had not yet been built, and to depend on a prefabricated harbor, the details of which still were on the drawing boards. Aerial transport operations were limited to paradrops and glider operations of only local tactical significance.

Their decision, of course, was made before the present concept of airlift had been developed. Airlift was available within the world at that time in sufficient quantity to do the job, but mass airlift was only then being service tested for the first time over the HUMP. Serious questions undoubtedly would have been raised if the logisticians for that vitally important operation had depended in a large part on an unprecedented means of support and, at the same time, guaranteed the success of the invasion.

Yet the quantity of supplies moved from England was not too large for air transport, considering what airlifts have shown they can do.

*COSSAC—Chief of Staff, Supreme Allied Commander—the forerunner of SHAEF.

Four years later, only 350 airplanes carried one quarter of a million tons a month regularly to Berlin. Furthermore, during World War II, COSSAC had almost unlimited resources of aircraft at its disposal. From what we know today, the logistics of the job by airlift would not have been at all impossible.

The expansion of the airlift concept has been steady but very gradual. Today our planning calls for the carrying of either items in very short supply or those which can be transported in no other way. The time has come, however, for us to recognize and acknowledge that airlifts have proved an efficient and dependable means of transportation.

We have met exacting tests and passed them all. Our airlifts have demonstrated satisfactorily that we have the know-how to operate this new method of transportation; that we can guarantee results; and that neither geography, weather, nor military opposition can deny its use.

We must acknowledge that air transportation has joined the transportation family as a responsible and dignified member. No longer should we consider air transport only as a solution for emergencies resulting from international political crises or military requirements such as shortages of supply or rush delivery of high-cost items.

In the past 175 years we have increased the speed of moving supplies by surface means by only 2 miles per hour. It took 3½ days to move proper supplies from Boston to Portsmouth in 1776, and, in the later stages of World War II, it still took 106 days to get supplies from the United States to the combat commander in Germany—1½ miles per hour during Revolutionary days but only 3½ miles per hour in 1944.

This indicates we have not matched our logistics with our technological progress. The substitute for speed in delivery has been the building of enormous stockpiles and filling long supply pipelines. It is axiomatic that a combat unit is no stronger than its logistical support. Prior to World War II our logistical planning was geared to one-way operations. Never before had we been forced to fight in more than one part of the world at the same time, and never before had our combat units required so much to accomplish their mission.

We got by in World War II only at tremendous cost and only because the military verdict came when it did. Today, when battles might begin in one or many parts of the world simultaneously, we no longer can afford the building of huge stockpiles and long pipelines. The theory of an abundance of supply, stockpiled on all fronts, no longer is tolerable. We simply cannot stockpile supplies all over the world in anticipation of emergencies which may arise. We currently

require more than 200 days of supplies in our world-wide pipelines to insure one day's supply for our units in the field. Each day of supply we can eliminate by speeding the flow of men and matériel could mean savings of millions of dollars during peace and war, and the saving of human lives during war itself. To achieve this speedier flow, improved methods of transportation and careful logistical planning are essential.

Our air transports can move supplies and equipment with speed and certainty from factory to battlefield, speeding over slow surface modes of transportation with their bottlenecks in transportation centers and innumerable, costly unloadings and reloadings.

Similarly the elimination, or at least a substantial reduction, of the supply pipeline would mean fewer parts and less equipment would be required to accomplish the same task. This, coupled with the ability to change the flow of supplies from manufacturer to consumer by type of supply, or the flexibility to change the direction of the pipeline without the great waste found in the large stockpiles required in the old concept, would produce substantial monetary savings.

Consider a hypothetical case of an aircraft engine in current use in Korea or Europe: for 5 months it powers an airplane and for the next 7 months it is in the maintenance pipeline, spending a good deal more time in transit and in various receiving and shipping depots than in the maintenance shops. By conservative calculations, air transport of this engine from the plane to the maintenance depot and back to the plane would get it out of the pipeline 3 months faster than if it moved by surface transportation.

Suppose there were 10,000 engines in this year-round operational maintenance cycle. Airlift could eliminate at least 1 month of the cycle; hence one-twelfth of 10,000 or 833 engines would be saved. At a cost of \$50,000 each, the value of the engines saved would be \$41,650,000.

Consider that this type engine is one of many currently being purchased. Consider also that engines are only one of hundreds, even thousands, of expensive items needed to keep our Air Force a going concern. Each presently has a long and costly pipeline from factory to consumer, or to and from overhaul depots. Would not the savings be vast by a substantial pipeline reduction?

With good, cheap military air transport we can accept the philosophy that a substantial portion of reserve stockpiles lies within the potential production capacity of our great industrial machine. It must be noted that the frontiers of battle are no longer restricted to definite limits. Stockpiles in a given area becomes useless when the attack is halfway around the world from the stockpile. The

stockpiles in themselves represent a burden to be carried to the front. Going even further, it may be said that with the reduction of stockpiles, and with the flow from factory to front by air transport, the industrial potential of the nation can be expanded by the amount of man hours and other production factors which will have gone into stockpiles. That is to say, the entire productive capacity of the nation would be expanded to enable even greater output.

In the movement of personnel, our air transports in time of war can land on airfields or airdromes adjacent to the training camps of our troops, pick them up fully armed and carry them, in a few days, over congested railroads, over docks, over staging areas at dock-sites, over moored ships, over vessels at sea, over the docks and congestion at debarkation ports, and over the ground transportation between the ports and front lines. Furthermore, we can deliver them still tough and fresh from the training areas.

This would eliminate the personnel pipeline which in the recent war tied up hundreds of thousands of soldiers and frequently prevented their arriving at the area of emergency in the time they were needed most. It has been estimated air transport would reduce by three-fourths the number of persons in actual travel status.

We have heard frequent, unfavorable comments on the large numbers of men employed behind the front because they must maintain our long supply pipeline. With the wise use of air transport, and with confidence in it and reliance on it, it is certain the ratio of the men in the rear to men at the front can be materially reduced.

Our ability to contain potential enemies in the future may well be directly dependent on the employment of airlift. With the mobility airlift gives us, we can mass our armies anywhere we choose and when we choose. We can pick the place we choose to stand and fight rather than, as we did in Korea, let our enemy make the selection.

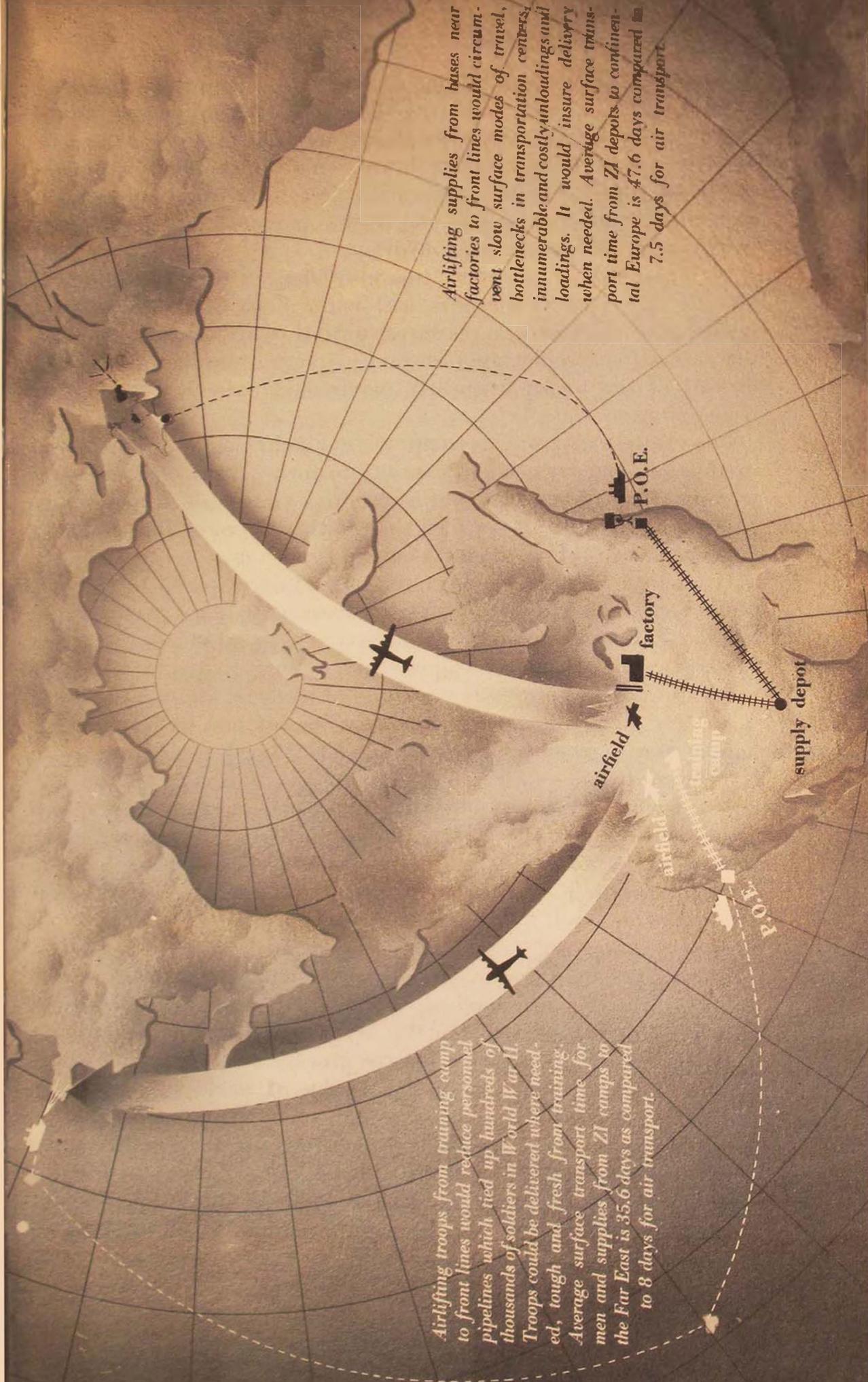
If, in any future full-scale war, the enemy is operating with the advantage of interior lines, we must not only overcome this advantage he has, but we must be able to parry his lunge with a good riposte. With the high mobility that airlift can give our ground forces and the inherent flexibility of our tactical air forces we can strike the enemy where he is weakest.

In event of emergency, transport of masses of men and equipment must not be dependent upon, nor delayed by, the slow recommissioning of our rusting fleets of Victory and Liberty ships and the equally slow build-up of a fleet of newer type ocean-going transports.

We can no longer depend on great armies steaming for days and days in vast surface convoys to a secret rendezvous. New type submarines, long-range reconnaissance, and modern intelligence systems

Airlifting troops from training camp to front lines would reduce personnel pipelines which tied up hundreds of thousands of soldiers in World War I. Troops could be delivered where needed, tough and fresh from training. Average surface transport time for men and supplies from ZI camps to the Far East is 35.6 days as compared to 8 days for air transport.

Airlifting supplies from bases near factories to front lines would circumvent slow surface modes of travel, bottlenecks in transportation centers, innumerable and costly unloadings and loadings. It would insure delivery when needed. Average surface transport time from ZI depots to continental Europe is 47.6 days compared to 7.5 days for air transport.



deny us this privilege. We must be able to pick up our forces, if necessary, in Germany and wing them to the Mediterranean or the Far East—wherever the sparks of war are smoldering or our strategists have planned their counterthrusts. We cannot afford, in this age, either the time lag or the vulnerability resulting from movement of our highly trained personnel and their costly, ultramodern weapons in slow, cumbersome surface convoys.

Well-planned air transportation also offers us the opportunity of keeping our valuable supplies within the Zone of the Interior or hundreds of miles back in rear areas until they are needed. Further, the orders for specific supplies can be changed in a matter of hours instead of the weeks frequently required at present when surface transportation is used.

The greatest asset of this country is our technology—our industrial production—our tremendous capacity to turn out materials in peace or war. In the event of war it is with these materials—this machine power, this production—rather than with manpower that we must fight any hordes which might be massed against us.

If we are going to make maximum use of our superior technology, of our men trained to use our superior weapons, we must have mobility and flexibility. It would be tantamount to national suicide to attempt to fight enemy hordes on a purely man-to-man basis. At the same time, we cannot afford huge stockpiles of material all over the world if we are going to make a maximum use of our technology, our fighter and bomber squadrons, and our trained men armed with modern weapons.

This technology, this production—plus our trained people—is equal to any hostile combination if we can bring it into play at the time we want it, where we want it, and in the manner we choose to employ it. Only the proper use of mass air transport can assure that this, our most valuable asset, will be effective enough to tip the scales in our favor.

In anticipation of the time when airlift, because of its many advantages, will be the basic method of military transportation, we must plan for its full utilization. We must plan to meet the military demands. We must plan for (1) the procurement of the best equipment, (2) an air transport system capable of world-wide operation and (3) the organization to manage it.

In planning to meet the military demands it is obvious the supply problems will vary. They will be different in the Zone of the Interior than in the overseas theaters and they will be different within the theaters themselves. Hence, different solutions as to the type of transport aircraft will be required. Rather than a theoretical or aca-

demie answer to the problem, much of the solution should be based on the geography of the world, including the location of island bases, distances from the Zone of the Interior to various theaters, and the size of the theaters.

Naturally, the size of the aircraft needed will vary but there are certain basic "musts" applicable to all transport planes, whether they are of the so-called troop carrier or MATS variety. They must be economical to build, economical to operate, easy to maintain, and easy to load.

Speeds which we get through normal development of an airplane and engine will always be adequate; we should not pursue speed for itself when designing military transport aircraft. So long as we maintain a comfortable ratio of air speed over surface travel, we have ample reason to employ airplanes. Relatively high air speed in the delivery of many supplies is unimportant unless it causes a favorable change in the equation which determines ton-mile costs. Cubic space, ease of maintenance, ease of loading, and fuel consumption per ton-mile are of equal, if not greater, value. Ton-mile costs are the vital consideration. Costs must be less than those required by the enormous stockpiles heretofore deemed necessary.

We want a tough, rugged airplane without fancy fittings—a flying freight car. If this plane can be built and will fly only 150 miles per hour, but at the lowest ton-mile costs, it will be preferable to high-speed, high-cost types. By ease of maintenance, we mean a plane which can be maintained by our young American airmen after a minimum of training—not a complicated one which requires the constant attention of master mechanics. At the same time, our cargo plane must be easy to operate so that our pilots fresh from flying school can handle it safely.

The types of aircraft employed are determined by the airline system and it is evident we should have feeder lines, trunk lines, and transocean lines in the system. The over-all system for transporting military supplies breaks nicely into three parts: (1) a local job within the Zone of the Interior, and also locally within the theaters; (2) the connecting of local lines within the Zone of the Interior and within the theaters by trunk lines; and (3) the transocean and transcontinental job which joins theaters, or the Zone of the Interior with the theaters.

The local operation requires short-range aircraft with cabin capacity of but a few tons and low density. Here could be employed what are now called troop carrier aircraft and troop carrier types of operation. The trunk line operations should be conducted by larger and longer range aircraft than the feeder type (probably in the 10-25-ton

TRANSCOCEANIC
TRUNK
FEEDER

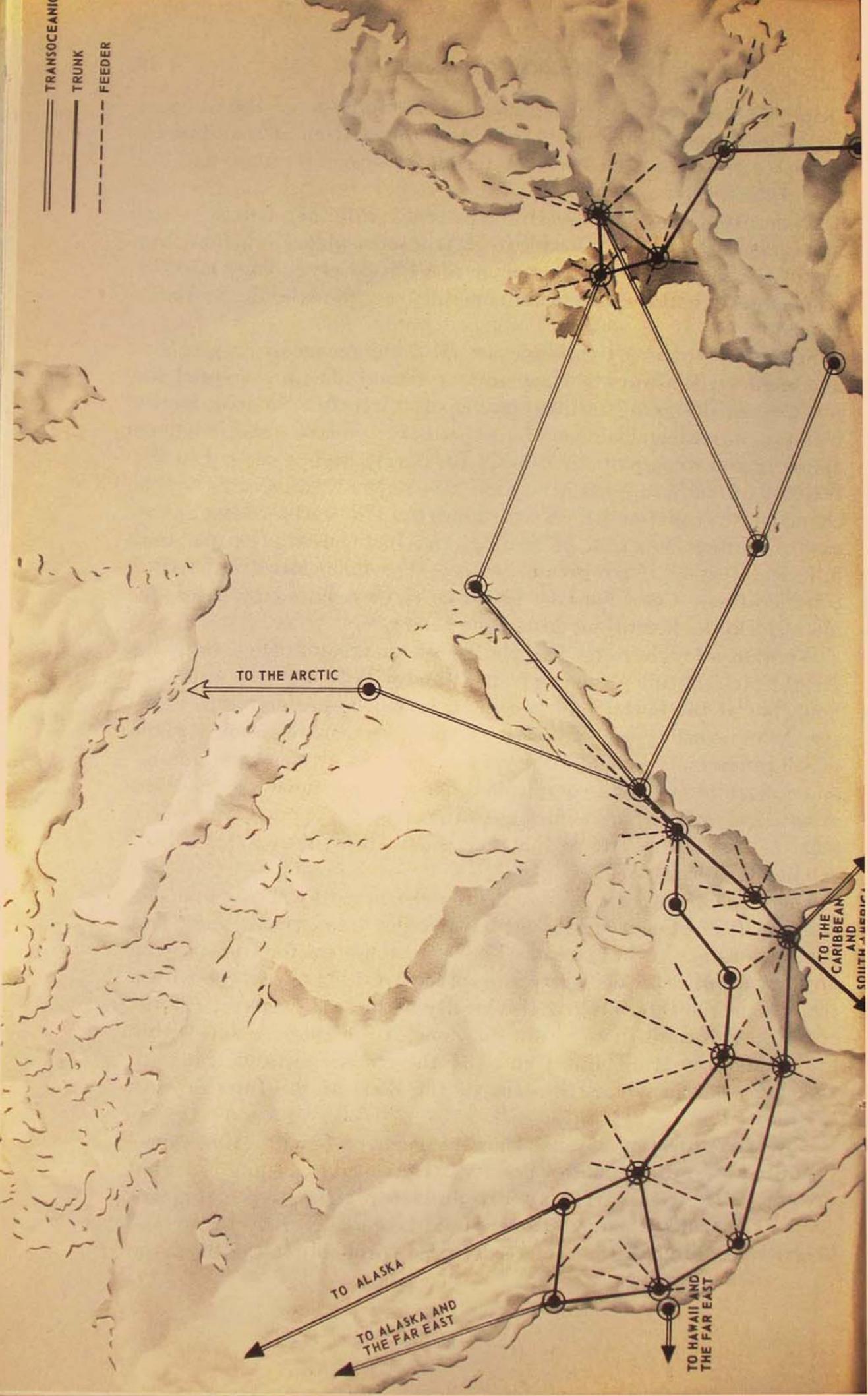
TO THE ARCTIC

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TO THE
CARIBBEAN
AND
SOUTH AMERICA





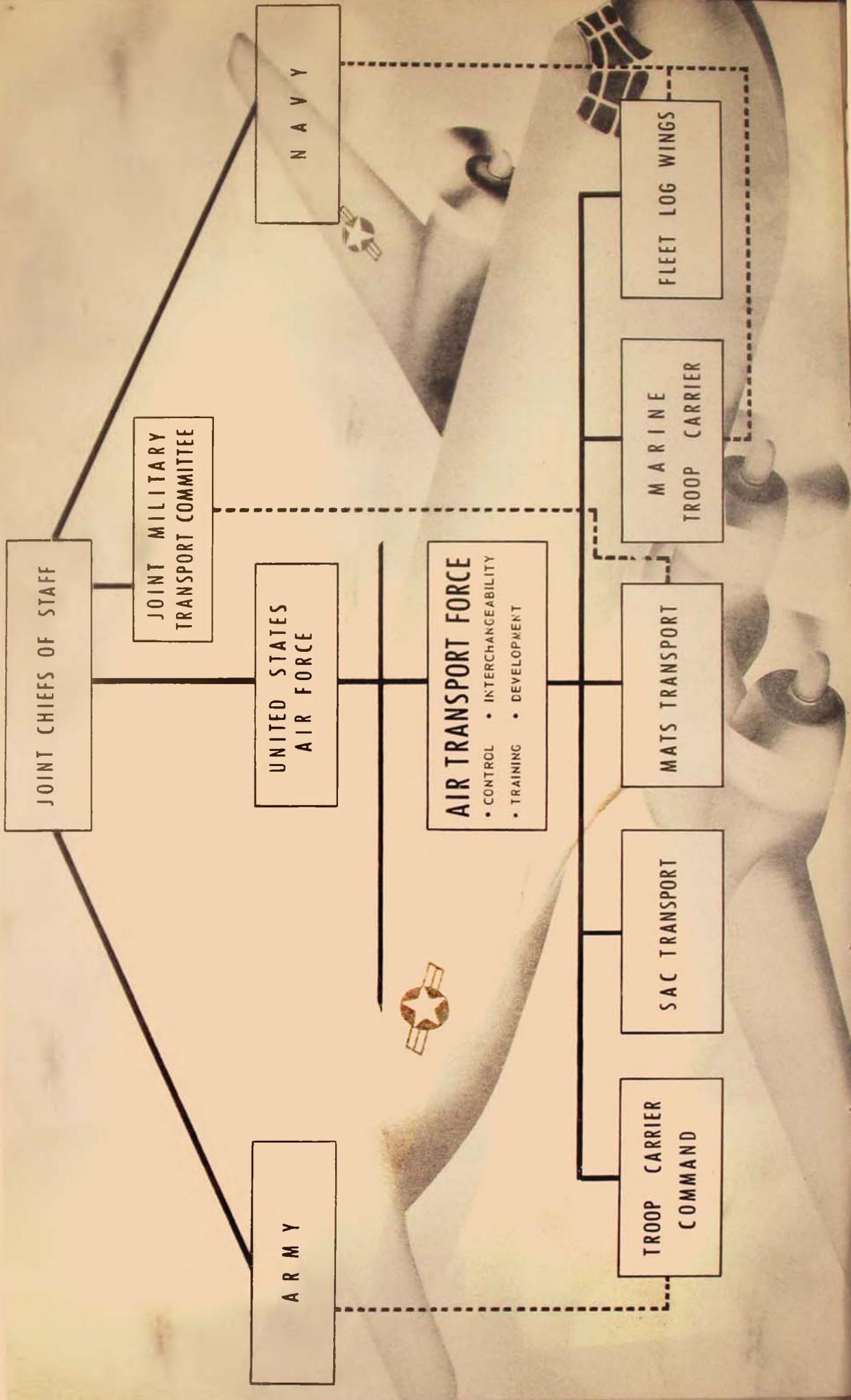
This scene graphically represents the contrast which confronts the United States. Both in China in World War II and in Korea, American technology has been pitted against inexhaustible manpower. As supply lines from the United States lengthen and ground transportation becomes more sketchy and primitive, mass airlift can reduce stockpiles normally required in every theater and shrink the personnel pipeline which would otherwise tie up thousands of troops. Technology can win over manpower, but only if it is carefully planned and organized, highly flexible, and centrally directed.

category with a normal range of 1,500 miles). It may only be two-engine aircraft; however, the same requirements for economical operation in the feeder type should apply. For the transoceanic and transcontinental lines even larger aircraft than the trunk line type, with greater range and with full attention to the low ton-mile costs, would be required.

In consideration of the above, it is my opinion that all of the local, trunk, and transoceanic lines should use the same facilities and should be closely integrated as a single system under a single management.

During the past several years there have not been sufficient transport planes available to handle all our airlift requirements. Planned production and procurement programs indicate this condition will exist well into the future.

To get the maximum utilization of the limited air transport equipment available at this time, all of our air transport capabilities must be used in the best interests of the country as a whole. Air transport today is scattered among many commands of the Air Force as well as the Navy and Marine Corps, all of whom do not have the same standards of utilization and priority urgency for their use.



I feel the consolidation of these aircraft into a single command is the most efficient way to do this job. This single command would be charged with the responsibility for airlift according to the urgency of the requirements of all of the armed services—in other words, the first needs of the nation.

Even with an abundance of transport aircraft, it is not hard to conceive of situations, especially in time of war, when demand might temporarily exceed the capacity. This happened to surface transport during World War II. It occurs occasionally in our railroad network in peacetime. But today and in the foreseeable future, instead of an abundance of air transport, we will have this vital element of transportation in short supply. It is most important that our priority system for its use include all the air transportation available and that its product be made available, according to the situation, to the Army, Navy, Air Force, or possibly civilian agencies.

I must say I believe this necessity for a single organization cannot be overstressed. Unless this can be achieved, our air transport resources will be frittered away in small packages. Since 1943 there has been considerable discussion on the feasibility of integrating all air transportation in one organization. This whole question must be considered from the standpoint of world-wide requirements as well as the capability of the United States to produce transport aircraft.

When we can build planes to do our transport job cheaply, provide a reduction in costs in the pipeline, and give better and more prompt service to our fighting customers through the right organization, the right transport system, and with the right planes, then we have made our technology a real substitute for manpower in time of war. Then we can use it to further the advance of civilization in time of peace, for the commercial world will adopt our airlift pattern and put it to use for other than military purposes. Then Tennyson's poetic prophecy, "saw the heavens fill with commerce . . .," will be a reality.

Air Matériel Command

Integration of all air transportation into a single command, suggested (left) by Gen. Turner, would insure maximum utilization of our aerial transport resources and serve, with far greater efficiency, the first needs of the nation in peace or in war.

International Law and Aerial Bombing

CAPTAIN HAMILTON DESAUSSURE

EVEN more than other forms of law, international law must derive its code from the repetitious history of the past, for unlike other forms of law, it is seldom backed by force. It must rely upon the cumulative moral weight of opinion in the world, and this opinion must first be created and allowed gradually to crystallize into definite patterns of thought.

The world has been forcibly reminded of this fact by the welter of confusion existing since the First World War on the subject of the international conventions on aerial bombing. The various attempts in the past 50 years to set up international rules for bombing have not been sufficiently inclusive or definitive, nor have they yet attained the status of world moral law by virtue of age and custom. Thus when in April 1948 a plea was made before the American Society of International Law for constructive consideration of the rules of aerial warfare, particularly with respect to bombardment,¹ this plea went unheeded because of two current trends in international thinking.

Since Articles 1 and 2 of the United Nations charter outlaw war, it is argued that regulation of its conduct has ceased to be relevant. The International Law Commission, meeting at Lake Success in April 1949 to codify international law, rejected any study of the laws of war because "public opinion might interpret such action as a lack of confidence in the efficiency of the United Nations for maintaining peace."² In this same tenor, the General Assembly of the United Nations in January 1952 created the Disarmament Commission charged with preparing a draft treaty prohibiting "all major weapons adaptable to mass destruction."

The second anti-international law trend stems from the teachings of General Giulio Douhet, whose book, *The Command of the Air*, is a stimulating text on aerial bombardment. General Douhet believed that any international agreements governing the conduct of war were fated to be "swept away like dried leaves on the winds of war." For Douhet, methods of war could not be classified acceptable or unacceptable. War would always be inhuman, and any means which contributed to the defeat of the enemy were justified. Limitations on the so-called atrocious means of war he scorned as nothing but "international demagogic hypocrisies."³ The most authoritative substantiation of this view by a military leader of World War II emanated from Air Marshal Harris, wartime chief of the British

Footnotes at end of article.

Bomber Command. In his *Bomber Offensive*, he goes so far as to state: "International Law can always be argued pro and con, but in this matter of the use of aircraft in war there is, it so happens, no international law at all."⁴

Several prominent international jurists also hold this view. A speaker before the American Society of International Law declaimed that the "laws of war belong to a past age and it is futile to attempt to revive them." He specifically adverted to the atomic bomb and aerial attacks,⁵ believing that, in the event of World War III, the victor will determine retrospectively whether such weapons as atom bombs and rockets with atomic warheads have been legitimate.⁶

Yet despite the assertions that no binding rules exist for aerial warfare, nations have repeatedly protested indiscriminate aerial bombardment as contravening international law. These protestations have been countered, not with contentions that there are no binding rules, but with denials that the specified attacks had been indiscriminate.

In September 1937 our Ambassador to Japan, Joseph Grew, delivered to Japan a note protesting the Japanese bombings of Nanking. The note alleged extensive destruction of noncombatant life and non-military establishments. Russia, too, protested the Nanking bombings and when asked by Japan to remove her consul from the city refused on the ground that the bombardments were illegal.⁷ In July 1939 the United States lodged another protest with Japan on the failure of Japanese war planes to distinguish between civilian and military targets in Chungking. Japan's reply was that she had never made any "indiscriminate bombardments."⁸ When the State Department protested the alleged Italian bombing of an American mission at Doro in the Sudan, claiming it "was an open, undefended village with no military works of any character, and an attack upon it constituted a deliberate and wanton assault on a nonmilitary objective and on non-combatant civilians," Italy denied the Doro attack, avowing that her pilots were under strict orders to avoid it.⁹ Conversely, when the Vichy government protested that American planes participated in the aerial raids on Le Havre and Rouen in the fall of 1942, the United States chargé d'affaires at Vichy replied that German military plants and property would be bombed wherever found in France, even though incidental harm to civilians might occur.¹⁰

In World War II, there were abundant humanitarian appeals for "legitimate" aerial bombing. At the war's outbreak, President Roosevelt appealed to the governments of France, Germany, Italy, Poland, and Great Britain to mutually abstain from aerial bombardment of "civilian populations" or of "unfortified cities." Within 2 hours France replied that orders had already been given to French forces to

limit air attacks to strictly military objectives. Speaking to the Reichstag, Hitler indicated he had given notice to the German Air Forces "to restrict its operations to military objectives." Poland also replied that her air force would refrain from bombing "open towns and from action directly dangerous to civilian populations." When Russia bombed Helsinki, the President appealed to the Soviet and Finnish governments to refrain from bombing civilian populations or unfortified cities. Finland's reply "approved this principle of International Law."¹¹ Russia did not respond. The day following the Helsinki raid, the United States invoked a moral embargo on aircraft shipments to nations guilty of "unprovoked bombings of civilian populations." In the meantime the Latin-American republics and the United States met at Panama and adopted a resolution appealing to the European countries to abstain from "bombarding open cities, objects, and places without military value, whether from the land, sea, or air."¹²

Again in Korea, nations are handling aerial bombing as if there are international rules governing the subject. On 7 August 1950 North Korea cabled a request to the president of the United Nations General Assembly to end the "savage bombing by the United States of the civilian population." The next day the Soviet delegate to the Security Council submitted a resolution which would "recognize the bombing by the American armed forces of Korean towns and villages, involving the destruction and mass annihilation of the peaceful civilian population, as a gross violation of the universally accepted rules of International Law," and would "call upon the government of the United States to cease in the future the bombing by the Air Force or by other means, of towns and populated areas." On 7 September, just before this resolution was put to a vote, the Soviet delegate reiterated his charge that USAF bombardments were intended to destroy industrial centers where there had never been any military objectives. This, he averred, was in violation of Article 25 of the 1907 Hague Convention, which in his view, was in force today. The United States reply quoted the Secretary of State to the effect that the activity of the United States forces in Korea had always been directed at the military targets of the invader, and that the United Nations command had exerted every effort to minimize damage and injury to peaceful civilians and property. The Soviet resolution was rejected nine votes to one, with Yugoslavia abstaining. India and Norway went on record against the proposal because no proof had been given that the bombing raids violated international law.¹³

Historical Development of Rules on Aerial Bombardment

The evolution of those rules of bombing upon which nations have

based their protests and appeals began in the Brussels Conference of 1874. Attended by delegates from all the countries of Europe, this conference ruled that "fortified places alone" could be bombarded. "Towns and villages" which were "open and undefended" could be bombed only if situated near a fortress and assisting in its defense. At the first Hague Peace Conference in 1899, the phrases "open town" and "fortified places" were discarded. Article 25 prohibited "the attack or bombardment of towns, villages, habitations or buildings which are not defended." In addition, Declaration IV of the first Peace Conference forbade for a term of 5 years the launching of projectiles or explosives from balloons "or by other methods of a similar nature." With the exception of China and Great Britain, all the major powers were signatories. At the second Peace Conference in 1907, the words "by any means whatever" were added to Article 25, making it indisputably clear that the interdiction against bombing undefended places also applied to aerial attacks. Article 25 as thus amended was unanimously accepted by all 44 parties to the conference, among whom were all the great powers. The prohibition against the launching of projectiles from balloons was renewed for a period extending to the close of the third Peace Conference, which has yet to convene. But Russia, Germany, France, Italy, Japan, Spain, and Turkey did not join in the renewal of this declaration. They agreed to the principle of outlawing bombing of undefended places but reserved the right to use the only aerial weapon available at that time. The effect of Article 25, when taken in conjunction with the failure to renew the 1899 Hague declaration, was to formally legitimize aerial bombardment for the first time.

The next and last inter-governmental attempt to codify rules regulating aerial bombardment was made by the Commission of Jurists, representing the United States, Great Britain, Italy, Japan, France, and the Netherlands, at The Hague in 1923. Aerial raids were ruled more comparable to naval warfare than to land warfare. The army commander can occupy an undefended locality within the zone of his operations, but a flight leader, like the captain of a ship, can deny to the enemy the resources of such a place only by destroying those resources. So the old naval concept of military objective was substituted for the army criterion of undefended place. Enumerated as proper objectives were factories engaged in the manufacture of military supplies, communications equipment, and transportation used for military purposes, and all military forces and their installations (Art. 25). Cities and towns could be bombed only if in the immediate neighborhood of battle zones where military concentration justified such bombardment (Art. 24). Bombing to terrorize civilian popula-

tion, damage private property, or injure noncombatants was forbidden (Art. 25). This was an adaptation of the 1907 land warfare regulations. Also derived from the old land warfare rules was the ban on aerial bombardment of historical, religious, cultural, or medical places (Art. 25). Where legitimate bombing would result in indiscriminate attacks on civilian population, it was prohibited. Not a single state ratified the Air Warfare Rules, but they are considered the most authoritative pronouncement on this subject. Japan in 1938 declared her intention to abide by them in the Sino-Japanese War.¹⁴

Prior to World War II, the League of Nations made two notable attempts to control aerial bombardment. In 1932 the General Commission of the Disarmament Conference adopted a resolution that air attacks against the civilian population were to be absolutely prohibited. In 1938 the nineteenth assembly of the League adopted a resolution stating that bombing of civilian populations contravened international law and stipulated: (1) the intentional bombing of civilian populations was illegal; (2) targets must be legitimate identifiable objects; (3) targets must be bombed in a manner which would avoid the negligent bombardment of civilian populations in the vicinity.¹⁵ In effect these were expressions of the basic principles of the Air Warfare Rules.

Several attempts were made by private international societies to attract official attention to the need for rules of air warfare. The International Law Association at Buenos Aires in 1922 and at Stockholm in 1924, the Comité Juridique in 1935, and the American Bar Association in 1939 all employed the test of military objective and condemned the indiscriminate bombardment of civilian populations.

The view that civilian lives and property were immune from direct aerial bombardment was also expressed in two decisions of the Greco-German Arbitral Tribunal in 1927 and 1928. These cases involved the German air raids on Salonica and Bucharest in 1916 which destroyed civilian lives and property. The tribunal allowed the ensuing claims, recognizing the principle that "life and property of non-combatants must as far as possible be respected." Both decisions, however, went on the dubious ground that attacking air forces must give preliminary warning of their strikes, and overruled the German contention that bombing from the air must necessarily be by surprise.¹⁶

Bombing Practices in World War I and II, and in Korea

From the German aerial bombardment of Antwerp in the very first month of World War I, it became increasingly clear that the tests of *fortified* or *defended* places, as proposed at Brussels and The Hague respectively, were to be ignored in air warfare. Paris was first bombed by air on 30 August 1914. London and Berlin were repeat-

edly bombed without regard for those criteria. Throughout the war bombing was conducted in a desultory fashion by single planes or small formations which dropped small bomb loads over widely scattered areas with no over-all objective. Accuracy was impossible. Even the most primitive bombsights were not developed until late in the war. No correction for wind drift and bomb tumbling was ever made, compensation for airspeed and altitude was only crudely computed, and the bombs themselves were mostly artillery rejects. These conditions made inevitable the proportionately high ratio of civilian casualties, as occurred in London, and the destruction of historical and cultural objects, as occurred in Italy. Most analysts considered that customs of the First World War indicated that aerial bombardment had not been primarily directed against the civilian population, although attacks had been made on thickly populated areas which contained military objectives.

Air warfare in the Second World War was inaugurated by the aerial bombardment of Warsaw and other Polish cities in September 1939. Then came the devastating Luftwaffe bombings of the neutral city of Rotterdam in the spring of 1940 and of London and Coventry the following fall. From the testimony at Nuremberg of Air Marshal Goring, his adjutant, Bodenschatz, Air Inspector General Milch, and Kesselring, then second ranking officer in the air force, it appears that the German high command recognized international rules of air warfare, and felt they had abided by them. Kesselring, who directed air operations in the Polish invasion, testified that in the German view, Warsaw was a fortress with strong air defenses. Only those targets considered admissible according to international law did he assign to the air fleet.¹⁷ In his opinion the stipulations of the 1907 Hague Convention "which could analogously be applied to air warfare" had been maintained.¹⁸ According to Bodenschatz and Kesselring, Warsaw's civilian population received several warnings to evacuate.¹⁹ Goring testified his airmen were instructed to attack forts and batteries within Warsaw, and that the Luftwaffe had attacked "exclusively military targets."²⁰ The bombing of Coventry was defended both by Goring and Kesselring on the ground that it housed the key industry—aircraft engines—for the British Air Force. This was admitted by Air Marshal Harris in *Bomber Offensive*. Goring stated that the bombing of Rotterdam was in support of parachutists who had no artillery, and that most of his flyers turned around without releasing their bombs. London was declared a target, related Goring, only after German cities not of military value were repeatedly bombed.²¹ But Air Marshal Tedder, in his book *Air Power in War*, maintains that until the indiscriminate raids on London in September 1940, England, in conformance with her reply to President Roosevelt's

appeal, had confined her bombing to specific targets such as synthetic oil plants, aircraft and aluminum factories, and communications centers. Only after those London raids were bomber pilots not required to bring their bombs back when they could not find an identifiable primary target. They were then allowed to aim at secondary objectives in industrial urban areas.

Aside from any thought of reprisal, the switch to area bombing was inevitable for the night-flying British Bomber Command, because bombing could not be precise after dark. One flying officer acted as both navigator and bombardier and was equipped only with a compass, map, sextant, and direction-finder loop. Under these conditions, the most successful method of night bombing was soon found to be the devastation of an entire area containing German industrial complexes. This was accomplished by upwards of 1,000 planes flying in trail over a specified target area lighted by flares.²² Although the RAF adhered to area bombing from the fall of 1940, it constantly improved its bombing techniques. Gee, Oboe, H₂S, and other radar navigational aids were developed in an effort to concentrate the bomb pattern over the target. With these improved aiming methods, indiscriminate and scattered bombing became less justifiable on both legal and humanitarian grounds.

The policy of the United States Army Air Forces in Europe was that of precision bombing of selected, individual objectives.²³ On 20 August 1942, just 3 days after the first American mission, a joint British-American directive assigned RAF Bomber Command night air bombardment, while the United States Eighth Air Force would control daytime operations.

On 7 October 1942, the American high command, through the British Broadcasting Company, warned all French people living within 2 kilometers of "factories supporting the German war machine to vacate their homes."²⁴ Then on 29 October a British Air Ministry directive forbade the "intentional bombardment of civilian populations." Reasonable care was to be taken to avoid undue loss of civilian life in the vicinity of the target. If a large bombing error would involve the risk of serious damage to a populated area, no attack was to be made. Military objectives were broadly defined to include any sort of industrial, power, or transportation facility essential to military activity. The directive concluded by exempting from the foregoing rules all German, Italian, or Japanese territory.²⁵

In practice the main effort of Allied air attacks was everywhere concentrated on objectives within the definition of that directive. From October 1942 until June 1943, submarine pens were the principal target. Then the aircraft industry and ball-bearing plants became the primary objective. In the summer of 1944, oil, together with

transportation facilities in the autumn, received the bulk of Allied air raids.²⁶ The term *military objective* as construed by World War II belligerents covered many more targets than enumerated in Article 25 of the 1923 Air Warfare Rules. Coal mines, electric power plants, and water reservoirs were bombed by the Allies at one time or another. Urban areas of industrial cities were considered legitimate though secondary objectives by Bomber Command.²⁷ In modern war, and particularly in a totalitarian state, the whole economy was viewed as one vast war machine. Certain economic resources, therefore, as well as resources directly utilized by the military, were considered legitimate objectives.

Article 24 of the Air Warfare Rules which prohibited bombing cities and towns not in "the immediate neighborhood of the operations of land forces" was obviously impractical from a military standpoint. Compliance with such a rule would have prevented the destruction of the vast war-making effort centered in the Ruhr industrial cities such as Cologne and Essen. Oil and munitions objectives located thousands of miles from any battle lines in such cities as Blechhammer, Czechoslovakia, and Oswiecim, Poland, and repeatedly bombed by the United States Fifteenth Air Force, would have been untouched.

In Japan, the USAF resorted to the British concept of area bombing. Sixteen square miles of the heart of Tokyo were burned out, largely in one night raid—9 March 1945—by 280 B-29's. Night incendiary attacks on the cities of Nagoya, Kobe, and Osaka followed in that order.²⁸ The abandonment of precision bombing was based on economic and operational considerations. Japan's war factories had become so highly concentrated in her intensely overpopulated cities that selection of specific targets would have been difficult. In addition war work was farmed out to individual homes operating as industrial units. Another reason for adopting area bombing was that the American air forces were flying night bombing missions on a major scale for the first time. This had been a chief factor in the adoption of area bombardment by the RAF. But even in overcrowded Japan, certain cities were ruled off-limits to bombers. Kyoto was crossed off a list of suggested atomic bomb targets by Secretary of War Stimson on the grounds that although this city was of considerable military importance, it was a shrine of Japanese art and culture, the ancient capital of Japan, and should not be attacked. The Interim Committee, which advised President Truman on the use of the atomic bomb, recommended that the bomb be employed without prior warning against military installations or war plants. Secretary Stimson viewed Hiroshima as the headquarters of the Japanese army defending southern Japan and as a military storage and assembly point, while Nagasaki was an important naval and industrial center.²⁹

In Korea United Nations policy has returned to precision bombing. A well-known Air Force publication, the *Air University Quarterly Review*, pointed this out with photographs showing how the locomotive repair shops in Wonsan, the dock yards of Chinnampo, and the military warehouses of Pyongyang were bombed without damage to the surrounding city. Increased bombing efficiency resulting from electronic and other improved sighting devices have enabled greater concentration of damage. "Such improvement," relates the *Quarterly Review*, "yields visible proof to the civilian population that bombing is confined to vital military targets [even when these precision targets] nestle in the midst of towns and cities."³⁰

Indiscriminate Aerial Bombardment as a War Crime

Indiscriminate bombing of Allied cities was not alleged against any of the major war criminals. However, in December 1945, a regulation had been promulgated by General MacArthur's headquarters which defined the "wanton destruction of cities, towns, or villages; or devastation not justified by military necessity" as a war crime. A similar United States Army regulation was issued for the China theater in January 1946. Australia, Netherlands, and Chinese law also made a war crime of "the deliberate bombardment of undefended places" and the "indiscriminate destruction of property."³¹ No prosecutions have been made under these laws.

In August 1942 a Japanese law, referred to as the "Enemy Airman's Act," stated in Article 2 that "bombing, strafing, or attack in any manner with the intention of destroying, damaging, or burning private property of a nonmilitary nature" was punishable by death. This law was *ex post facto* with regard to the eight captured United States airmen who participated in the Doolittle raid on Tokyo, 18 April 1942. Nevertheless the eight were sentenced to death under this law. At the time of their execution the State Department notified Japan that "American forces had always been ordered to direct their attacks upon military objectives, and it was known that the airmen . . . did not deviate therefrom."³²

Again in 1945, 14 American flyers were sentenced to death under a "Formosan Military Law," authorizing the punishment of all enemy airmen guilty of "bombing and strafing with intent to kill, wound, or intimidate civilians; bombing and strafing with intent to destroy or burn private objectives of a nonmilitary nature; or bombing or strafing nonmilitary objectives apart from unavoidable circumstances." In the war crimes trial of the Japanese officials responsible for the execution of these airmen, the legality of the "Enemy Airman's Act" and the "Formosan Military Law" was not ruled upon.

It was only stated that no legitimate evidence connected these airmen with the *alleged* illegal bombings.³³

An incidental reference to aerial bombardment appeared in the Einsatz-gruppen trial where a United States Military Tribunal declared:

*A city is bombed for tactical purposes: communications are to be destroyed, railroads wrecked, ammunition plants demolished, factories razed, all for the purpose of impeding the military. In these operations it inevitably happens that nonmilitary persons are killed. This is an incident, a grave incident to be sure, but an unavoidable corollary of battle action. The civilians are not individualized. . . . The one and only purpose of the bombing is to effect the surrender of the bombed nation. The people of that nation, through their representatives, may surrender and with the surrender, the bombing ceases, the killing is ended. Furthermore a city is assured of not being bombed by the law-abiding belligerent if it is declared an open city.*³⁴

This tribunal, then, believed (a) the bombing of tactical objectives within a city is a legitimate method of warfare, and (b) a city can be assured of immunity from air attack if declared an open city. It is submitted that the first of these propositions is correct but not the second.

A city containing no real military objectives is not a proper target. Both Paris and Rome were rarely attacked from the air and then the utmost care was taken to bomb only constricted military targets. Kyoto's historical value ruled her out as a legitimate objective. The first proposition is also borne out by the War Crimes Commission's compilation of persons against whom a prima facie case of illegitimate bombardment had been made. Whenever the available evidence indicated the place attacked contained a military objective, the case was rejected by the Commission; but all those persons alleged to have intentionally bombarded places containing no military objectives were cited.³⁵

As to the second point, the practices of the Second World War indicate that a city to the rear of ground operations was not immune from air raids merely because it was declared an open city. In April 1941, Yugoslavia declared Belgrade an open city, but Belgrade was bombarded from the air 4 days later. On Christmas, 1941, the American command in the Philippines declared Manila an open city and withdrew the defenses and the civil government. Within 48 hours the Japanese made a very heavy air raid on civilian quarters in the old walled city. In August 1943, Italy declared Rome an open city, but the United States Fifteenth Air Force bombed a few carefully selected military targets thereafter. Again in June 1944, Rome was declared an open city by the Germans, but the Allies did not recognize this declaration as binding upon them.³⁶

The official positions of nations, both in their public declarations and in their war crimes legislation, and the bombing habits of belligerents in two great wars and several minor ones suggest certain broad rules governing aerial bombardment.

1. Bombardment which has for its sole purpose the terrorization of the civilian population is not sanctioned by public opinion anywhere. Both Great Britain and the United States rejected "morale bombing" in World War II and it is not now being employed in Korea.

2. The almost universal standard for lawful bombardment is that the target be a military objective. The concept of defended places has been recognized as obviously inadequate in its application to air attacks. A *defended place* has even been construed to mean *any* place within the combat radius of defensive fighter cover, or *any* locality which has antiaircraft guns anywhere between it and enemy air bases.

3. With modern war enveloping the entire economy of a nation, *military objective* has been redefined to include the industrial and economic potential of a country. In addition, an entire *area* may constitute a military objective under certain conditions. Spaight considers area bombing to be sanctioned where the target is a "place d'armes" but not where there are only one or two precise objectives in the area.

4. The enlargement of military objective has diminished a nation's total "civilian" or "noncombatant" population. As more people engage in such essential military industries as munitions and armaments, they automatically transfer themselves into that part of a nation's economy legally subject to direct air attack.

5. Identifiable medical, historical, or religious locations have never been a proper target. This principle, embodied in both The Hague and the Air Warfare rules, has been generally observed by most belligerents from the very beginning.

6. All military objectives in any enemy city are legitimate targets. Here the practice of both world wars seriously deviated from the Air Warfare rules, which would require such cities to be in the "immediate neighborhood" of land operations. It would rather appear that once a city houses objectives of military value it becomes a proper target for *area bombing*. The policy of the American air forces in Europe and of the United Nations in Korea indicates a trend toward precision bombing of specified objectives, even in industrial cities. Unfortunately this has not solidified into a universally adopted custom.

7. Intentional indiscriminate bombardment is not sanctioned by international law. And with constant improvement in aiming devices and bombing techniques, reckless bombing can be classed as intentional or at least as wantonly disregarding its consequences.

Three considerations must be carefully borne in mind in any attempt to translate such general conclusions into concrete rules.

1. No rules which impair military efficiency can have any hope of being observed. An exception to this may be found in the case of rules governing weapons of extermination, such as poison gas and germ warfare, where the sure promise of retaliation is so terrifying that use of those weapons is classed as impairing military efficiency. It is fortunate that the concentrated attacks on key industries are not only more humane than indiscriminate and scattered bombings, but are also militarily and economically more effective. Recall the words of General Arnold:

To accomplish the strategic purpose, it is necessary to destroy only a small proportion of industry, probably not more than a fraction of the total required to conduct modern warfare on a large scale. Indiscriminate, widespread destruction of enemy industry is simply a waste of effort.³⁷

2. Careful definition of the terms *military objective*, *civilian population*, and *noncombatants* is necessary since these words are accepted criteria in legitimate bombardment. *Military objective* was defined too restrictively in the 1923 Air Warfare Rules, thereby sacrificing most of the value in the enumeration of proper objectives contained in Article 25.

3. In codifying rules on aerial bombardment, it is better to work for a practical minimum upon which all nations can agree than for a desirable maximum, which would thereby destroy unanimity of acceptance.

It is disheartening that the 1907 Hague rules represent the last successful effort of nations to agree upon any rules of aerial bombardment. The only existing source of rules for bomber commanders are those Hague rules as outlined in Field Manual 21-10. The criterion there is the anachronistic concept of the defended place (Art. 48). The Italian War Law of July 1938, at least drew on the customs of World War I and of the 1923 Air Warfare draft. Under that law, bombardment of enemy objectives was permitted when their destruction would benefit military operations. Such objectives included cities which could reasonably be presumed to "harbor military preparations or supplies."³⁸ British pilots are left completely in the dark. The 1944 edition of the British Manual of Air Force Law dispenses with the entire subject of the rules of air warfare in a solitary footnote:

In the absence of any general agreement as to the principles governing the conduct of air warfare, it is as yet impossible to include a similar chapter on air warfare.³⁹

This vacuum in policy for bomber commanders still obtains, even in the face of the Strategic Bombing Survey's conclusions that aerial

bombardment was a decisive factor in the defeat of the Axis—an opinion substantiated by the German high command's almost unanimous admission that ultimate defeat resulted from "enemy air power."

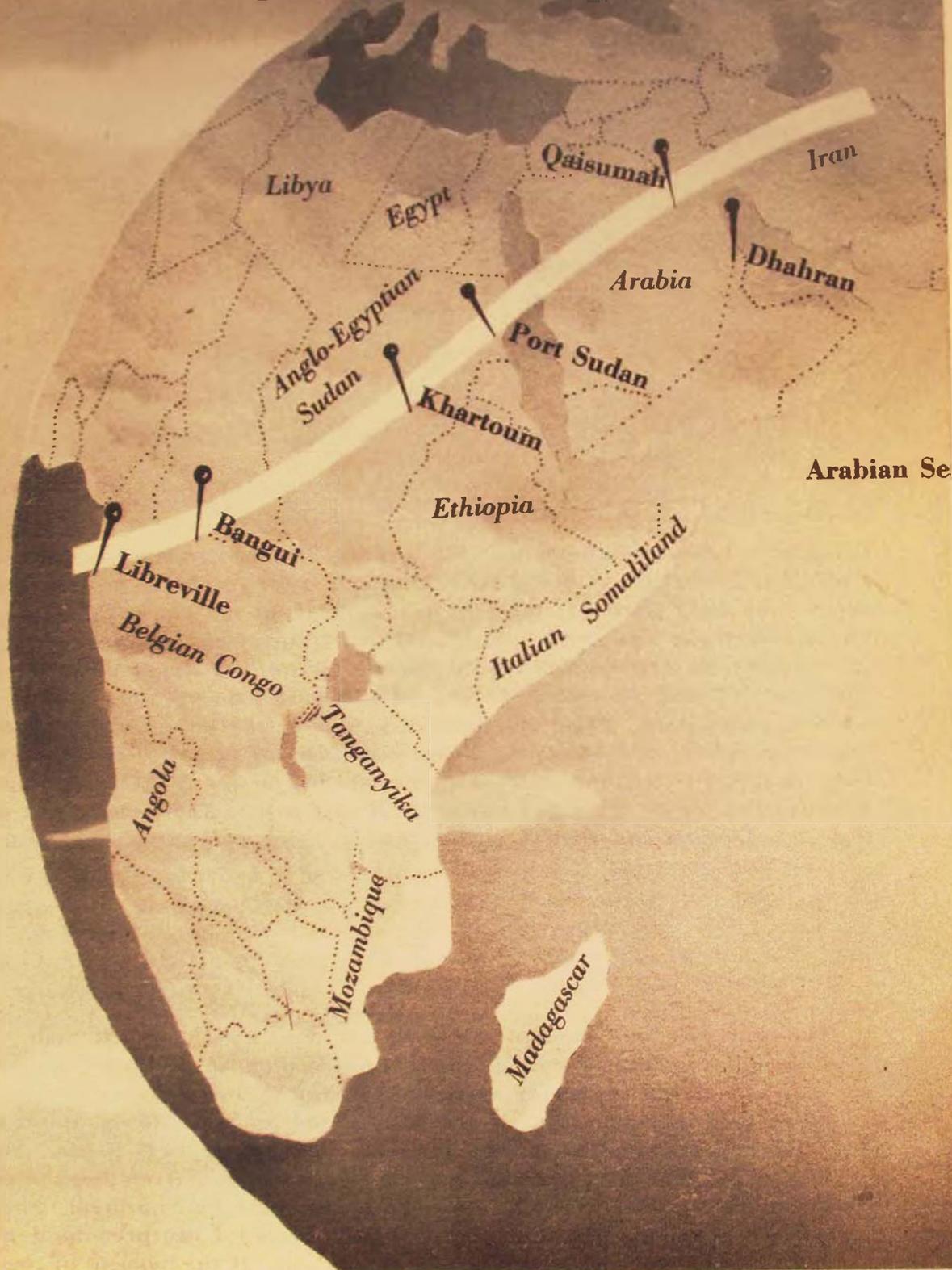
A backward glance at the ruins of Europe's cities and the 25 million persons directly subjected to air attack, a look into the future toward the atomic bomb, the rocket, and the guided missile make even more apparent the real necessity for codifying acceptable rules for this universally emphasized method of warfare. If such rules can prevent the bombing of one such historical building as the Benedictine Abbey at Monte Cassino, or one such city as Manila, then they will have been a thousandfold worth while.

Military Air Transport Service

NOTES

- ¹ *Proceedings of American Society of International Law* (1948), p. 32.
- ² "Report of the International Law Commission," *American Journal of International Law Supplement* (1950), XLIV, 7.
- ³ G. Douhet, *The Command of the Air* (New York, 1942), p. 181.
- ⁴ A. Harris, *Bomber Offensive* (London, 1947), p. 177.
- ⁵ *Proceedings of American Society of International Law* (1949), p. 110.
- ⁶ G. Schwarzenberger, *A Manual of International Law* (London, 1950), p. 90.
- ⁷ "Les Bombardements Aériens," *Revue Générale Droit Aérien* (1938), VII, 201.
- ⁸ *Documents on American Foreign Relations* (Boston, 1940), II, 270.
- ⁹ Naval War College, *International Law Situations 1940* (Washington, 1942), p. 115.
- ¹⁰ Naval War College, *International Law Situations 1942* (Washington, 1943), p. 14.
- ¹¹ *Documents on American Foreign Relations*, II, 352, 353, 385, 725.
- ¹² *American Journal of International Law Supplement* (1940), XXXIV, 12.
- ¹³ *Yearbook of the United Nations 1950* (New York, 1951), pp. 235-238.
- ¹⁴ L. Oppenheim, *International Law* (London, 1940, 6th edition), p. 413.
- ¹⁵ *Ibid.*, pp. 413, 416.
- ¹⁶ "Coenca Brothers *vs.* Germany, Greco-German Tribunal," *Annual Digest* (1927-28), case number 389; "Kiriadolou *vs.* Germany," *Ibid.*, (1929-1930), case number 301.
- ¹⁷ *Trial of the Major War Criminals* (Nuremberg, 1947), IX, 178.
- ¹⁸ *Ibid.*, p. 175.
- ¹⁹ *Ibid.*, pp. 35, 175.
- ²⁰ *Ibid.*, p. 337.
- ²¹ *Ibid.*, p. 340.
- ²² Harris, *op. cit.*, p. 80.
- ²³ W. F. Craven and J. L. Cate, eds., *The Army Air Forces in World War II* (Chicago, 1948), I, 597.
- ²⁴ Craven and Cate, *op. cit.*, II (1949), 240.
- ²⁵ *Ibid.*
- ²⁶ *Ibid.*, p. 367.
- ²⁷ Lord Tedder, *Air Power in War* (London, 1947), p. 102.
- ²⁸ General H. H. Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War* (1945), p. 37.
- ²⁹ "The Manhattan Project," *Interavia* (1947), II, 26.
- ³⁰ *Air University Quarterly Review* (1951), IV, no. 4, 58, 59.
- ³¹ *Law Reports* (1947), I, 114, 115.
- ³² *Law Reports* (1947), V, 3, case 25.
- ³³ *Ibid.*, p. 61, case 32.
- ³⁴ *Law Reports* (1949), XV, 110.
- ³⁵ *Ibid.*, p. 110, note 2.
- ³⁶ *British Yearbook of International Law* (1945), XII, 258-264.
- ³⁷ *Report of the Commanding General of the Army Air Forces to the Secretary of War* (1945), p. 62.
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USAF Solar Eclipse Expedition



Six observation stations dotted the 3,200-mile path of the total solar eclipse across Africa. Five of the stations—Libreville on the Atlantic Coast of Africa, Bangui in French Equatorial Africa, Khartoum and Port Sudan in the Anglo-Egyptian Sudan, and Qaisumah in northeast Saudi Arabia—lay in the direct path and experienced total eclipse. The sixth, Dhahran in eastern Saudi Arabia, lay some distance to the south and experienced only partial eclipse. It was selected to determine whether partial eclipses can be recorded accurately enough to be used in earth measurement.



Curious French colonial officials and natives at Fort Archambault in French Equatorial Africa gaze at one of the expedition's C-119's as it stopped for refueling on the long flight from Khartoum to Bangui. Two of the Flying Boxcars carried all personnel and equipment, including jeeps, trailers, and radio and electronic gear to and from airstrips near the six observation sites and served as the expedition life line. Without air travel the expedition would have required several years advance preparation. Prior to eclipse day each of the six sites was visited by expedition officers and observers. Local conditions at each station were studied, radio reception tested, and arrangements completed for the 25 February operation. Headquarters for the expedition was at the British post at Khartoum. The cooperation from French and British civilian and military authorities was invaluable.

The exact size and shape of the earth has never been known to man. He still cannot fix with exactitude the relative positions of points on two continents, for he cannot survey an ocean. Measurements across great areas of unsurveyed mountains and deserts still are not precise. No one needs this missing information more than the makers of aeronautical charts. Some 2 years ago the Aeronautical Chart and Information Service learned of a theoretical method by which earth distances could be measured. Simply stated, the varying light intensities would be recorded just prior to, during, and immediately after a total eclipse of the sun. If the moment of totality could be recorded against time signals across a great area of the earth's surface, the distances between the recording stations could be accurately computed from the known speed of the moon's shadow.

There remained the matter of an eclipse. One was to take place on 25 February 1952. It would be visible along a great arc beginning over the Atlantic Ocean beyond the west coast of Africa and sweeping across the Dark Continent to Saudi Arabia and northward. A USAF project was authorized and the job assigned to the Aeronautical Chart and Information Service.



Squatting at the foot of Southern Horn Hill, the lone tent pictured here housed the observation camp near Dhahran on the Persian Gulf. Endless expanses of sand and rock stretch over the horizon, lifeless under the burning Arabian sun. Accurate measurement and charting of hundreds of thousands of square miles of this type terrain has never been possible. Dhahran was the only site where eclipse was not total. It was selected to determine whether the instruments were sufficiently sensitive to record variations in light intensity in a partial eclipse with enough precision to pinpoint the moment most closely approaching totality at that location. If the Dhahran experiments succeed, partial eclipses can be used to measure distances.

The observation station near Bangui was located in the hilly big-game country of equatorial Africa, inhabited by primitive natives. A dirt airstrip nearby furnished easy access to this spot. With the cooperation of members from a local French meteorological station and the excellent weather on eclipse day, scientists at this camp experienced few difficulties. The moment of total eclipse at the desert sites of Port Sudan, Qaisumah, and Khartoum was accompanied by a sharp drop in the temperature and a startlingly sudden quieting of the constant desert winds.





Hundreds of hours were spent, both in the United States and in observation camps, training for the day of total eclipse. Here one of the scientists is testing his photoelectric cell and astrocompass. The device extending upward from the photoelectric cell simulates the various degrees of light variation during eclipse.

Equally important in training for the big day was practice in monitoring the electronic equipment which recorded the photoelectric impulses and time signals. Tabulation and evaluation of scientific data gathered by the expedition has not yet been completed. But early evidence indicates this method of earth measurement will be a great step in advancing man's knowledge of his world. It will eliminate much of the margin of error in our maps and aeronautical charts.





The key scientific instrument at each station along the line of eclipse was the photoelectric cell mounted on the astrocompass. This instrument recorded varying light intensities occurring just prior to, during, and immediately subsequent to eclipse totality. The roll of graph paper on which these light intensities were recorded also registered time signals radioed to each observation camp from the United States Bureau of Standards. By simultaneously recording the moment of totality at a series of stations spaced along a great linear distance on earth's surface, the determination of distances between those stations could be precisely established from the known speed at which the moon's shadow travels. The simplicity of equipment, by comparison with the customary elaborate apparatus used in previous eclipse observations, made the expedition remarkably inexpensive.

The results of the expedition are now being studied. If the USAF Eclipse Expedition 1952 proves its worth, a new tool of great precision will have been made available to the cartographer. A series of such expeditions may play a large part in correcting inaccuracies in present maps of large, sparsely inhabited land areas. Perhaps the next will be a recording of the solar eclipse in 1954 which will be visible in a wide arc across the more northern latitudes.

Air Force and the Totality of War

COLONEL JOHN T. FITZWATER

TO SPEAK of war or air force, even with the utmost care, is to risk being misunderstood. We often seem confused by what Mr. Bernard Baruch calls "the inexorable continuity between peace and war." And so we speak of wars of nerves, cold wars, limited wars, and total wars without being satisfied with our understanding of war itself. We of the Air Force talk glibly of air power but not so much of air force. Yet it would seem that there is a useful distinction to be made between these terms and that our primary concern should be for air force.

By air force is meant that portion of air power which with its more immediate supporting elements can bring firepower to bear on enemy targets. Such a delimitation is by no means intended to deny the existence of air power or of all the advantages which accrue to a nation through development and use of aeronautics, commercial and military. Nor is it intended to deny the great capacity of air power, and air force itself, to serve as a powerful, versatile, and flexible instrument in the shaping and execution of national policy in peace as well as war. Indeed there is a great need for a better understanding of the capabilities of air power as an instrument of national policy. This matter has been very ably discussed in a recent article in the *Air University Quarterly Review*.¹

But the effectiveness of air force as an instrument of national policy depends ultimately on its ability to achieve objectives by delivering firepower on enemy targets in a "shooting war." It is the ability of air force to get results when the "chips are down"—to win a "hot war"—that ultimately determines the value of air force as an instrument of persuasion, as a threat, as a deterrent, as peace power. If this be true, then it is with air force and war that we must first be concerned.

The proposition that air force has added a third element and a third dimension to warfare is hardly debatable any more. Control of the air is rather generally recognized as essential for the successful operation of surface armies and navies in war. The effectiveness of air force in relatively close support of surface action is established. But when we consider the application of air force to targets further removed physically, logistically, and politically from the battle lines, the picture loses focus. The nub of the problem is this: what is the relationship of what we call strategic air force to war?

The security of the United States, of the free world, and even of our civilization may well depend on our understanding of the proper role of strategic air force in war. The evidence that we do not have an adequate general understanding of this problem is so generous that it need not be recounted here. Let us rather ask why we have an incomplete knowledge of the relationship of strategic air force to war. Where is the gap in our knowledge and how may we begin to correct the deficiency? A discussion of this question must involve a conception of war and the basic forces out of which war grows and by which and upon which it operates.

The Basis of Power

Like the crash of cymbals on the final note of an emotion-shattering symphony, atomic explosions over cities of Japan concluded World War II. Since the beginning of this human conflagration, 40 million lives and the equivalent of \$4 trillion had gushed into the great machines of war; "total" and "world" war we called it. The peoples of the world lay shocked and exhausted. As perception slowly began to return, they saw confusion and disorganization. In the United States a headlong dive toward domestic "normalcy" developed. Americans were not inclined to peer into or beyond the clouds of smoke and debris of World War II which still filled the air. There was a detached confidence in the practicality of a world organization to enforce peace, and in the atomic monopoly of the United States. But in the clouded atmosphere, among the troubled peoples and in the devastated soil of Europe, Asia, and the islands of Britain and Japan lay evidence of a disturbing, entirely new order of international forces. The evidence was not visible to the casual or naive observer and many were the sophisticates who proved to be quite naive.

We Americans were inexperienced in our new role of international leadership. In spite of two world wars, our tradition was to avoid "foreign entanglements" and it hid from us the inevitability of our involvement in a world-wide system of social and economic* forces. Man's fondness for intercourse with other men has been coupled with modern developments in transportation and communication to bring us into intimate involvement in this world system of forces. Many of our old axioms of geography were now invalid. What is more we were no longer self-sufficient in mineral resources. Power relationships had undergone a vast change as a result of the war. Our national

*Unless otherwise indicated, the term "social" is used in the broadest sense, and will include all manner of behavioral association and relations between people. Likewise, the social sciences will be taken to include all of the behavioral sciences such as politics and psychology. The writer is aware that this does violence to academic classification but it will serve here to simplify terminology without destroying intended meaning. The term economic is given a similar broad interpretation.

security and the security of the free world became threatened by a great power whose ambition was unlimited.

We seemed also to have forgotten that behind political and military problems there are fundamental social and economic forces at work in the world. We were tardy in understanding that the Communists were forcing the conflict to the level of fundamentals. While important enough and quite interesting within themselves, modern military operations involved the consideration of, and operated directly on, basic social and economic factors to an extent never before encountered. Our adversary in Korea was not just a sovereign nation. It was a highly organized, trained, and disciplined international political party operating with the support and under the control of the second largest power in the world.

Traditional diplomacy was not equipped to deal with such a situation. Old concepts were no longer valid. In any event the forces being employed by the enemy were not purely economic and military. Communist tactics and strategy ran the full range of the scale of conflict from philosophical persuasion through all forms of violence, with all but the last "stop" pulled.

Now let us take a look at power. What is the nature and source of power in international relations? In the final analysis, national power determines what will be the relationship of man to his physical environment and to his fellow man. He has found it mutually advantageous to share his efforts in the development of his physical environment and thus has given rise to economics—the creation and distribution of wealth. Likewise he has found it mutually advantageous to band together according to rules which protect his family, his physical possessions, and the development of his way of life. Thus we have society—culture, politics, and nationalism; the development of man himself and his relationships to his fellow men. Art, science, technology, industry, politics, government, war, religious forms, and all the multiplicity of patterns of modern life have grown out of the "play" of socio-economic force. But has this been "play"—random occurrence—or has it been the natural order?

Man has always shown toward his physical world a far greater curiosity and desire for mastery than he has about himself and his behavior toward other men. We are a race of "gadgeteers." Unfortunately we have permitted our penchant for "gadgeteering" to invade the fields of our social and economic activities before we gained an adequate fundamental knowledge of sociology and economics. The general effect has been to obscure the need for an understanding of the true nature of the basic forces at work in man's world. Our schools of politics have taught that there are four types

of power: political, military, economic, and ideological. The truth is that there are at most two basic types of power—social and economic—and that the political and military bodies are but manipulators and derivatives of basic power—extensions of the socio-economic forces which create them.

Nor have we been at great pains to understand our economic nature. The faith of many staunch advocates of strategic bombing weakened during the last war because they were unaware of the great cushion which existed in the German economy. Certainly such a state of knowledge is significant for warfare and particularly for strategic warfare. To a large extent our lack of knowledge of social and economic forces is the effect rather than the cause of our preoccupation with machinations and forms and vested interests.

We hear it said now and then that we could live at peace with the present regime in Russia were it not for their aggressive intentions. Is it really true that man is willing to live for long in man-made isolation from a large part of his fellows? The Finletter Commission thought not. In their report they state, "In the long run only an informed world can be free and only a free world can be secure."

Man's association with other men has been greatly facilitated by comparatively recent developments in communications and of particular importance have been developments in transportation. The effect has been literally to join the entire globe in a continuous system of socio-economic forces, which to a considerable extent defy national boundaries and sovereignty. This system acts very much like the familiar physical power systems operated by our public utilities. With uneven distribution of culture and physical resources, any power system has its strong and weak areas. There is a tendency toward equilibrium; a change in one part of the system is transmitted throughout the system with a general reaction. The United States is inextricably tied into this world field of socio-economic forces. Not only will its people naturally communicate and associate with the other people of the world, but its dependence on the rest of the world will grow as it becomes more deficient in physical resources.

What does all of this have to do with war? In an address in 1947, Lord Tedder, the British airman, said,

. . . there are factors which do not change, or only change very slowly. Geography does not change—though its effect on military operations may be modified by technical changes. Human nature does not change, and national characteristics and temperament change but slowly. Economic factors, generally speaking, change slowly. These are some of the main factors which determine strategy, and the problem (of the strategist) is to arrive at a balanced judgment as to the interrelationship between the rapidly changing technique (of war) and the more constant factors.²

But our judgments should have the benefit of all the facts which it is possible to get on the "constant factors"—most complex and difficult of assessment in themselves—and the effects which can be produced on them by the techniques available to us. We will do well, in attempting to solve our problems of war, to check our solution against the proposition that power arises out of the use the individual has made of his physical and social environment; that the forces generated are basically social and economic in form; that they cannot be grossly contained by artificial barriers; and that they are joined in detail in a continuous global system. If we would seek to influence a part of this global system of socio-economic force we would do well to acquaint ourselves in the greatest possible detail with its nature as well as with the means available to do the job. And we might well be concerned that the inevitable reaction of the system as a whole will be in consonance with our aims.

These are some of the fundamental power considerations for war, and they raise a very important and basic question. What is the significance of these fundamental power considerations for the relationship between the people and the state? For after all the object of war for democratic countries is to change the conduct of people as manifested through their government, whether it be the same or a new government; or through war to create conditions by which such a change of conduct can otherwise be brought about. No universal and completely successful answer to this question could be expected unless all governments and all peoples had the same essential characteristics. But this by no means denies the present validity or usefulness of these fundamental elements, nor does it deny the possibility of finding principles which, in relating the elements to one another, will lend us understanding of the relationship of specific peoples to their government.

The Totality of War

It is difficult to speak of war in any exact sense. To do this would require a commonly accepted, comprehensive definition of war together with an assessable and fairly constant relationship between cause and effect. No such definition does exist, and the specific causes and objectives of war have been almost as numerous and varied as the belligerents have been. Yet if we are to discuss war we must have some common conception of it.

War is a means to an end and not an end in itself. If wars were ever fought as sporting events or "just for the hell of it," this can no longer be the case on any important scale. Specific aims in war may have an almost infinite variety. Historically about the only valid

generalization on the aims of war is that they represent an attempt on the part of one nation to control to some extent the behavior of another nation. This would be true, of course, even if the specific aim were the acquisition of a territorial or material concession. Lord Tedder subscribes to this manner of definition when he says: "Expressed in its simplest terms, war is the process by which a nation endeavors to impose its will on its opponent."³ Such a definition provides nothing of the technique or manner of warfare and therefore fails to locate war on the scale of conflict. If we must make room in war for such terms as "cold war" and the journalistic version of "total war," then we run into the difficulty of a definition which would have to be broad enough to encompass all of the means by which "a nation endeavors to impose its will on its opponent." But before deciding this matter it may be helpful to take a quick look at what has happened to war.

The character or manner of wars of the past has been determined to a large extent by the instruments and techniques available. Notwithstanding the alleged static nature of the "military mind," advantageous technological developments sooner or later have been applied to the waging of war, all the way from the sling and bow and arrow to the guided missile and the atomic bomb. It is interesting to note some of the characteristic trends in the evolution of weapons and the significance they have had for warfare.

First there has been the increase in the range and fire power of the weapon itself, accompanied by an increase in range and capacity of weapons carriers. The effect has been to remote and impersonalize engagement between military forces. More important, these developments have enabled the military to extend both the range and magnitude of their destructive force from the lines of surface and air engagement to all points beyond these lines and now to the very source of strength of the enemy nation. The decisiveness of this capability in space and fire power is amply demonstrated by the effects achieved by strategic bombardment on Germany and Japan in World War II.

Along with this increase in range and fire power has come an increase in speed and maneuverability of forces. The tactical advantages of speed and maneuverability are generally recognized, but the strategic possibilities are often overlooked.

The fantastic increase in the cost of war from the days of Caesar to World War II highlights two of the most significant effects of the evolution of weapons and techniques of war. In full-scale war, mechanization of military forces has reached such proportions that almost the entire economic and manpower resources of a nation are required to produce, supply, and man the war machine, with a

consequent dislocation and disruption of normal social and economic patterns and immense consumption of mineral resources. Mechanization also puts the very highest premium on intellectual superiority for all personnel involved in warfare, from research and development to using the finished weapon. The emphasis can no longer be on quantity unless it is on "quantity of quality."

Strategic warfare is as old as the history of war. But prior to the American Civil War it was not the dominant nor decisive manner of war even in naval warfare. Wars consisted principally of engagements between armies and between navies to determine which of the warring nations was the stronger militarily and therefore capable of imposing its will on its opponent.

Yet once the shooting is over, one must ask how the victor goes about imposing his will on the vanquished. Sometimes he has marched in and plundered—satisfied his aims by force. More often a peace has been negotiated on his terms. But the important point, often overlooked, is that the ultimate tool of the victor is the potential threat or actual use of further destructive military action. In the case of a totally obstinate opponent the victor has no recourse but to completely destroy him both as a military and civilian entity, even though he must destroy much that he would rather preserve. The victor must have "command of the land"—the ability to apply force on land wherever necessary to dominate the behavior of the vanquished. Yet we never encounter the term "command of the land." We speak of "occupation" without an awareness of its true significance. It is the power to further subjugate the enemy if he will not otherwise behave acceptably.

With the Civil War, the term "total war" formally comes into the picture. The concept of "total war" is generally traced back to the "nation in arms" of Napoleon and the concept of "absolute warfare" expressed by Clausewitz. Nevertheless many military historians credit Americans with its first modern demonstration. Liddell Hart describes the American Civil War as the prototype of modern "total" warfare:

The devastation of Georgia by Sherman, and of the Shenandoah Valley by Sheridan, were designed to undermine the resistance of the Confederate armies by destroying their homes, as well as their sources of supply . . . they were decisive in producing the collapse of the Confederacy.⁴

It is pretty well agreed that the attack on the source of Confederate strength had at least pronounced influence on the outcome of the "shooting war."

Although World War I was decided on strategic grounds, it was characterized by a sort of static warfare. Germany and Austria

were blockaded and surrendered with the army still intact. Air force, in its puny infancy, made its first real appearance in this war in both tactical and strategic roles. Yet from this meager demonstration, farsighted men such as Field Marshal Smuts of South Africa and the prophet of military aviation, General Douhet of Italy, were able to forecast the decisive role and capability that air force would develop. In its adolescence it confirmed these forecasts during World War II. The First World War saw the use of gas, the shelling of cities, and the first use of tanks and strategic air bombing. It was a strategic war of attrition and it was total war in both the sense of the history of war and the possibilities of its day.

World War II was the first war in which air force was used on a scale comparable to that of land and sea forces. The need for air superiority and air support of army and naval operations was clearly established. Some surprises developed in strategic bombing. The morale of the people proved to be far more sturdy and resilient than expected and the economic system was not just a series of segments but a complex, adaptable "organism." For Americans, not the least surprise was the inability of heavy bombers to penetrate to its target in small numbers and return without sustaining excessive losses. This condition necessitated bomber escort and a battle for "command of the air."

The strategy of World War II was a surface strategy, and although air force was decisive in the outcome of the war, the true significance of the part it played was hidden to many. The victory over Germany came when the Allies achieved "command of the seas," "command of the air," and "command of the land," in that order. In the case of Japan, victory came through "command of the air" and then "command of the seas." "Command of the land" was surrendered to us to avoid starvation, or worse, the total destruction which was made imminent by the atomic bomb. Air force had demonstrated its ability to destroy sources of national strength, but the meaning of this capability for diplomacy and war were not clear. Certainly for Germany and Japan, World War II was "total war" in every possible sense.

Now let us take a look at the war in Korea, variously called "limited war" and "false war." Since World War II the peoples of the world, and therefore the socio-economic forces, have been drawn toward the opposite poles of two incompatible socio-economic theories, with the free world at one pole, the Communists at the other, and a fringe area in between. Ostensibly the Korean war began as an attempt of the North Koreans to dominate the whole of a Korea which remained divided after the last war. The aims of the two belligerents at this

stage were in accord with our earlier definition of war. But the war quickly took on an international complexion and the two poles came against each other. The original objectives were overshadowed in the new situation and the new objectives were complex indeed. Evidently none of the major participating powers has been willing to face the risk of global war. Consequently there have been no attacks on the source of strength of any of the participants. It appears now that for the Communists the Korean war is a part of a great broad strategy to gain control of forces that will enable them to dominate the world. The objective of the United Nations is to drive the aggressors back and thereby contain and frustrate the Communist strategy. Beyond the sincere concern for the Korean people on the part of the United Nations, the outcome of the war is vital to the strategy of the free world in its opposition to the Communist bloc. But "command of the air, sea, or ground" in Korea is nothing more than tactics in a larger strategy. Is this attrition warfare? If so, is it economic, social, or both? Whatever the answer, only the form can be new. The objective is the same even if less direct. We have been thrown off balance to find war in a supporting role to a strategy that is "across the board," involving an international extrapolitical force with no tactical scruples.

Let us return to our problem of the definition of the objective of war as "a means by which a nation endeavors to impose its will on its opponent." What can we say of the means or techniques of war? Where is war located on the scale of conflict? By the very nature of its primary instruments and techniques, war is a violent and destructive process—destructive in both creation and operation. Threat of force or of war is, in the broad sense, a diplomatic and not a military tool. Modern war is complex and costly, so much so that it can only be undertaken after all other efforts to achieve the objectives have failed. It is therefore at the extreme end of the scale of conflict, a highly organized and not a minor form of violence. Let us then define war as *the process by which a nation endeavors through the use of organized violence to impose its will on its opponent.*

Now we have also seen that there are "limited" wars and "total" wars. We need too a means to locate a war within the range of organized violence on the scale of conflict. Wars have ranged from engagement between armed forces to direct attack on the source of power of the opponent. Control of this source of power is an objective of war. Then the totality of war may be said to be the degree to which the sources of power and the economy of belligerent nations are brought under direct attack by military force in any form.

Air Force

If we are to analyze the problems involved in the development and application of air force, we must first know several things. We must know the job or jobs of air force and how it gets these assignments. We must also know the capabilities of air force, for these capabilities are the tools with which we have to work. Determining the job and the tools are the gross elements of the problem. How well the jobs of air force are done depends not just on skill in the use of tools. We must have a precise knowledge of the job that is to be done and we must have the best tools with which to do it. It is in this analysis that we are most often deficient. We Americans, in particular, are quite adapt at making tools once we have decided what job we will do. Quite likely it is this tooling ability and capacity for over-tooling that conceals the poor job we have frequently done in analyzing our mission. In considering international forces, there is a tendency for superficial analysis.

Unknown data, including mere assumption about future developments, enter the equation. Yet numerous data are susceptible to logical, statistical, and scientific treatment, not only in the fields of technology and logistics, where scientific methods are now constantly used; not only in tactics where they are sometimes used; but also in the fields of strategy and joint strategy, where they are never used. It is a deplorable fact that the higher the level of command, and the more general, i. e., far-reaching, a decision, the less science and logic are employed. "Great decisions" are still made by intuition.⁵

The question at once arises as to what the Air Force can do about this job analysis business. The Air Force must anticipate the jobs which may need to be done and be prepared to advise the civilian side of government as to the effectiveness with which its tools can be brought to bear on all or part of any anticipated task. The thoroughness, exactness, and the confidence with which the Air Force provides such information will determine in large measure the nature of the jobs it is given.

The Air Force strategist must have an intimate knowledge of national objectives, interests, and policy, and he must also have a working knowledge of the nature of social and economic forces and the world power system in which they operate.

It is only with such knowledge that he can participate effectively in the determination as to what tools can best be used in a possible war, what effects can be achieved with air force, and how it can best be applied. This knowledge is even more important in a defender nation where men must anticipate rather than select the conditions

Geopolitics and Air Power

DR. JOSEPH S. ROUCEK

MODERN war is much too deadly, too expensive, and too dangerous to the entire structure of a nation to be undertaken for reasons of sentiment. The cold light of history makes it all too clear that defender nations take up arms only when the threat of aggression is upon them or is so imminent that it would be foolhardy to hesitate longer. This point of decision, whether for offense or defense, has always been influenced by geopolitics.

In each stage of development, whether an ancient city state or a modern industrial nation, the political unit, has propounded a plan of aggression or defense based upon its own geographical position, its resources, and the military weapons with which it could exploit its advantages.

Every so often a new weapon or system of weapons has come along. If this new weapon is a revolutionary departure from the conventional means of warfare, it forces the politicians and military men of the time to pause and revise their whole concept. Thus the English long-bow ended the long reign of the armored knight on horseback, and gunpowder rendered vulnerable the grim castles which for centuries had been the strongholds of feudalism. Not that the order changed in a day. Sometimes decades were required to perfect the new weapon. Usually it took a series of bloody triumphs to convince mankind that here was a new force which must be reckoned with. But the change did come, and when it did man's thinking on the scope of his political ambitions and the nature of war was never again quite the same as it had been in the days before the advent of that particular weapon.

In our century we have such a weapon in the military aircraft. It has been tested and developed in two world wars and numerous lesser theaters. Perhaps only now, armed with global range, sonic speeds, and the atomic bomb, has it arrived at the state of potency when nations must reassess their most fundamental concepts to determine whether this is the beginning of a new age in international power politics.

During both world wars the United States was strongly predisposed toward the democracies and their cause by virtue of our national ideals and heritage. But the fact remains that when it came to actually declaring war, the American people entered both deadly struggles largely for a realistic geopolitical goal: the prevention of

a single, hostile, continental power from achieving the domination of the European continent.

Dominant Influences in Geopolitics

Sea Power:

Spokesman: Mahan

Control and use of sea space are the most important prerequisites for world power. The country or combination of countries possessing the largest navy and merchant marine and the bases necessary to support them can dominate world trade, blockade and starve or bankrupt enemy nations, and exercise decisive world influence.

Chief exponents: Great Britain, United States

Land Power:

Spokesman: McKinder

Control over the largest mass of continuous land and population is the most important prerequisite for world power. The greatest land mass in the world is the European-Asian continent. With new inland commercial centers and improved overland transportation, the ruler of this land mass can ignore sea routes and isolate naval bases around its perimeter. **Chief exponents: Germany of World Wars I, II, U.S.S.R.**

The Crux:

The United States and Great Britain in combination fulfill Mahan's requirements for command of sea space. Yet two world wars have demonstrated that this supremacy has limited advantage when applied against a land-based power. Soviet Russia controls most of the European-Asian continent, yet her power has ebbed from its fullest tide and she hesitates to launch an all-out bid for power. The answer to the malfunctioning of traditional axioms of geopolitics may lie in the rise of a new kind of power created out of man's conquest of the air. No longer can navies and merchant marines rule the waves without the permission of land-based air power. No longer can the possessor of the largest land army count his Heartland inviolable. Air power has entered the equation. Here Professor Roucek explains the basis of mid-century geopolitics.

Although Hitler's efforts to conquer Eurasia were developed under the spell of Haushofer's *Geopolitik*, actually the concept was but a continuation and an extension of the German Kaiser's dream of *Drang nach Osten*. The Berlin-to-Bagdad railroad (really from Constantinople to the mouth of the Persian Gulf), which Germans began working on in 1888 and left four-sevenths completed in 1914, was intended to make the Kaiser's dream come true. Such a railroad would have given Germany an outlet on the Persian Gulf close to India and the shortest land route between the Atlantic Ocean (North Sea) and the Indian Ocean (Persian Gulf). A hegemony over this gateway to the Orient meant for the Kaiser that Great Britain and

France—sea powers—would become second-rate powers and Germany—the land power—the greatest empire on the globe.

Intellectual tone was lent the Kaiser's *Drang nach Osten* dream by geopoliticians Paul Rohrbach and Frederick Naumann. Naumann, following Paul Anton de Lagarde's concept of Mitteleuropa, preached an economic and political union of Central and Balkan Europe administered by a vast German-dominated empire. Rohrbach contended that the British Empire could be attacked and mortally wounded in the Near East. That sounded good to the Kaiser; it also sounded good to Hitler. The Kaiser almost got what he wanted. In World War II, Hitler made much the same dream his own and came even closer to success.

But Hitler's Germany, a land power, was defeated by sea power (Great Britain and the United States), with the help of Soviet Russia (a land power), and a geopolitical vacuum was created in Europe. The results were astonishing within only 5 years. In five short years, Soviet Russia "conquered" without war more territory and more people than the Nazis had been able to bring under their rule by direct fighting during World War II. Specifically, Soviet Russia had, after World War I, an approximate area of 8,176,000 square miles. In 1950 Soviet Russia's territory comprised 8,591,700 square miles.

To these figures must be added the satellite states in Central-Eastern Europe and elsewhere, so that, in 1950, in addition to its own 8,591,700 square miles and 200,000,000 population, the U. S. S. R. controlled: in Europe 404,000 square miles and 91,778,000 people, and in the Far East, 4,420,000 square miles and 461,000,000 population—making a grand total of 13,415,700 square miles and 752,878,000 people.¹

According to the most brilliant exponent of geopolitics, Sir Halford John MacKinder, from whom Nazi Germany, and later the Soviets, borrowed much in planning for their blueprints of a "future world order"—

Who rules East Europe commands the Heartland;
Who rules the Heartland commands the World Island;
Who rules the World Island commands the world.²

Today, the U. S. S. R. dominates nearly all of "Central-Eastern Europe," nearly all of the "Transversal Eurasian Axis," nearly all of the world's "Heartland," the territory extending (as Sir Halford MacKinder conceived it) from the Volga to the Yangtze and from

¹ Committee on Foreign Affairs, *Background Information on the Soviet Union in International Relations* (Washington, 1950), pp. 49-52; E. Day Carman, *Soviet Imperialism* (Washington, 1950).

² Sir Halford J. MacKinder, *Democratic Ideals and Reality* (New York, 1942), p. 150; the thesis was originally delivered as a lecture: see "The Geographic Pivot of History." *The Geographic Journal*, XXXIII (1904), pp. 434-437.

the Himalayas to the Arctic Ocean. Its present position represents the total fears of two generations of geopoliticians—a tremendous agglomeration of continuous territory under one rule and a relative invincibility to attack from the sea. Yet Soviet Russia does not “command the world,” and will probably never succeed in achieving this goal. The reason for this assumption can be found in the changing concepts of geopolitics, especially in relation to the development of modern air power. For a proper understanding of these changes, we shall have to consider the development of the geopolitical theories and their actual application.

The Geopolitical Theories in the Pre-Air Age

Only in recent decades has the student of power relationships arrived at a full understanding of the geopolitical aspects of international relations. But even today the relationship of the airplane to the basis of sea power and land power is not popularly appreciated.

Geopolitics, as the name indicates, is politics related to geography. The exponents of this doctrine stress that international relations, and thus internal relations, are controlled by the hard facts of geography. Ideas and ideologies, and particularly moral concepts, they claim, have little to do with the machinations of international power politics.

The minor role which ideological convictions have played in international decisions is illustrated by the betrayal of Czechoslovakia, “the last democracy in Central Europe,” by its democratic allies at Munich; or by the “eternal friendship” between Hitler and Stalin who, although deadly ideological enemies, joined forces for the sake of expediency and to allow the attack on Poland by Hitler and the dismemberment of that country by both nations. And how else can we explain the wartime collaboration between the “western capitalists”—Great Britain and the United States—and their deadly ideological opponent, the Soviet Union? Or, to carry logic of this kind to its bitter end, the decision in Washington to help the “democracy” of South Korea had really less to do with political system there than the geopolitical factors involved. Both the Japanese and the Germans, the most dangerous foes of the United States during World War II, are now being rapidly drafted into the anti-Soviet camp, since they, geographically, are important bases from which to stop or attack Soviet forces.

On the basis of this reasoning, geopolitics demonstrates that there are certain historical and geographical forces which determine the course of national decisions. Hence geopolitics is not only a scientific attempt to describe as precisely as possible the international behavior of states, but also has become a set of doctrines used to promote

national objectives. Historically, philosophers and geographers from Plato through Kant developed the idea that political geography is founded on physical geography.³ In this country, for instance, Frederick Jackson Turner and his more capable disciples developed a really dynamic concept of the historical geography of the United States.

The Influence of Mahan

The relating of American geopolitical background to the course of world history by Admiral Alfred Thayer Mahan was the first thorough investigation of the relation of sea power to national policy. From 1890 until his death in 1914, Mahan produced a flow of articles and books defining the principles of sea power and urging the United States to embrace these fundamentals in cooperation with Great Britain. For Mahan, sea power was the most important factor in history. He claimed that control and use of sea space for military and commercial purposes had determined the outcome of all major wars from the middle of the seventeenth to the beginning of the nineteenth centuries. He regarded sea power as intrinsically superior to land power as a form of national strength. In addition to the roles played by production, shipping, and colonies, Mahan listed six general conditions which bear upon the development of sea power: geographical position, physical configuration, extent of territory, population, national traits, and character and policy of governments.

Mahan's theories were quite influential in the formulation of United States policies and have left their imprint upon all subsequent thought on sea power. He became the prophet of "manifest destiny," playing the same role in relation to President Theodore Roosevelt, Senator Henry Cabot Lodge, Albert J. Beveridge, and John Hay that the fabulous General Haushofer and the German geopoliticians played in relation to the Nazis.

Landpower Theories

The most definite theory of land power was developed by an Englishman, Sir Halford MacKinder, from whom the Nazi geopoliticians borrowed much of their blueprints for world conquest. He interpreted history mainly in terms of conflicts between sea power and land power, and was especially interested in the conditions under which

³ For good historical surveys of the geopolitical doctrines, see: John E. Kieffer, "Geopolitics—Development and Perversion," *Realities of World Power* (New York, 1952), IV, 26–35; "Political Geography and Geopolitics," in Joseph S. Roucek, *Twentieth Century Political Thought* (New York, 1946), pp. 313–336; G. Etzel Pearcey, "The History and Development of Political Geography," in G. Etzel Pearcey and Russell H. Fifield, eds., *World Political Geography* (New York, 1948), pp. 22–36.

one of the traditional forms of power displaced the other. He questioned the superior claims for sea power advanced by those who accepted Mahan's theories, and warned that the relationship between sea power and land power was about to shift in favor of the latter. Sir Halford urged Britain to prevent Germany from ever conquering the heart of Europe. Viewing world politics as a struggle between oceanic and continental peoples, he claimed that any country which could control the "Heartland" would control the "World Island," and thus the world.

Haushofer, after absorbing MacKinder, stressed the significance of that stony string of sea bases that joined England to its colonies and dominions. What, Sir Halford has asked, could menace them and the sea power which upheld them? Answer: one power possessing a body of land so vast and rich that sea power could never encircle it effectively. Sir Halford saw such a body of land in what he called the "World Island"—Europe, Asia, and Africa. He imagined it as a mighty whole, relegating the British naval bases on its edges to insignificance. On this vision Haushofer developed his special schemes to realize such a huge World Island. Haushofer watched Britain's Dominions loosening their ties with the motherland. Believing there was no real friendship between the United States and Britain, he hoped to see a neutral United States in World War II, giving Germany (a land power) the chance to defeat Great Britain (a sea power) by "marching around the oceans"—that is, by conquering the naval bases along the rims of the "Transversal Eurasian Axis." At the same time the great battle fleets could be reduced to scrap iron by swarms of U-boats and airplanes.

The rising importance of the mainland in world politics was accounted for by Haushofer. With the recent development of a continental trade economy, the great inner land areas had become "less dependent on the coast." Hence, domination of the continental production centers had become decisive. No longer was domination of the trade routes at sea of crucial importance.

With this as his premise, Haushofer took for granted the political decline of Britain, since British power was based upon her domination of trade routes. All territorial unities resting upon ocean trade and maritime relations would, he felt, be soon broken. Control of the great land mass of Eurasia, not control of the sea, was the aim of Germany's high politics. The "Heartland" was the best possible base for land power, potentially the greatest fortress on earth. By dominating it, Germany could eventually dominate the world.

Hitler tried to carry Haushofer's idea into the realm of practical application. But the impressive Soviet resistance, supported by Allied

sea power and air power, led to the ultimate defeat of Haushofer's grandiose schemes.

The Emergence of Soviet Russia

In assessing the position of the U. S. S. R. in the immediate future, two important factors, unforeseen by MacKINDER, must be considered. Before the Soviet regime, it could have been assumed that Russia would remain an essentially backward state, unskilled, underdeveloped, and imprisoned within its land borders. Then the domination of Russia by an aggressive, industrialized Germany was the only likely threat to world peace. But during World War II the U. S. S. R. emerged as a great power in its own right. Politically, the state is well organized. Economically its productive capacity is now second only to that of the United States. As a military force, it is now the most outspokenly aggressive nation in the world. In brief, Soviet Russia has developed its own empire in the Heartland. Today, as the Korean experiment has shown, Soviet Russia is engaged in its expansion toward warm waters in Asia, while the Central-Eastern European region is intended as a jumping-off place for the conquest of Western Europe. Why, in spite of these advantages, has not the U. S. S. R. gone on to world conquest, as previously was considered inevitable? The answer lies in the modification of geopolitical theories due to the development of air power.

Air Power and Geopolitics

One of the most remarkable phenomena in the most recent decades has been the development of the airplane and its utilization for military (and civil) power. But it was only after the outbreak of World War II that "air power was given general official recognition as an expression of national strength."⁴

Air power has a tremendous advantage over land power and sea power. While land and sea restrict and canalize communications, the air alone permits relatively unfettered movement. Militarily speaking, the primary purpose in the use of air power is to attain an edge over the enemy sufficient to guarantee the advantages of using the air space for one's own purposes and of denying these advantages to the enemy. The development of air power has disrupted the tradi-

⁴ Donald Eugene Smith, *A Comparative Study of the Influence of Airpower upon the National Policies of Germany, Great Britain, the United States, and the Soviet Union* (Washington, Studies in Politics, Government and International Law, Abstract Series), I. 6. See also: Arthur W. Tedder, *Air Power in War* (London, 1947); Henry H. Arnold, the third war report in *The War Reports of George C. Marshall, Henry H. Arnold, and Ernest J. King* (Philadelphia, 1947); Carl Spaatz, "Strategic Air Power," *Foreign Affairs*, XXIV (April 1946); Edward Warner, "Douhet, Mitchell, Seversky: Theories of Air Warfare," in E. M. Earle, etc., *Makers of Modern Strategy* (Princeton, N. J., 1944), pp. 485-503.

tional concepts of national power. The "tactical" use of air power has changed the conditions under which control of the land-sea space is now exercised. "Protection from enemy aircraft and positive support from one's own air power in engagements on land and sea alike have become a decisive factor in surface warfare."⁵ Armies and navies no longer solely determine struggles in their respective elements. The strategic mission—the mounting and executing of operations to determine or directly influence the outcome of a war—was formerly the exclusive function of land power and sea power; today air power can directly and indirectly influence all aspects of war strategies—as shown by the bombing of the ball-bearing plants in Germany, or the preliminary phases of the attacks on the Japanese-held islands in the Pacific during World War II.

Within a brief period of time, the military airplane has revolutionized military and political strategies. This can be demonstrated in the case of the leading states.

Germany

Germany developed its national power with Prussia as its "core." This allowed the country to develop strategy which would capitalize on her advantage of interior lines of supply in war. But at the same time, since Germany was surrounded by powerful enemies on three sides, her geopolitical situation demanded the prevention of an alliance of these neighbors. Thus the principles of Prusso-German strategic concept required Germany to avoid two-front wars and instead to strike first at one, then at the other of its enemies. Military blows were developed along this pattern—a series of quick, lightninglike wars known as "Blitzkrieg." These moves were at first highly successful, but were eventually checked and settled into a stalemate, as shown in the trench warfare of World War I, and when Germany's armies bogged down in Russia in World War II. In World War II, Germany strengthened its land "Blitzkrieg" by integrating it with air power. The principle was to achieve air and ground superiority by surprise, and to overwhelm her enemy with the combination of surprise, tactical air support, and the advance of the *Wehrmacht* before Germany's neighbors could intervene. This strategy was nothing but the traditional Prusso-German strategy brought up to date by using air power in a supporting tactical capacity.

But the air forces of this land power proved not to be decisive when operating apart from German ground forces. With their thinking geared to consideration of air force as a tactical support weapon to

⁵ D. E. Smith, *op. cit.*, p. 10.

the Wehrmacht, they never fully understood nor developed a sound doctrine of employment of air force in the strategic role. As a result Nazi air power was unable to pulverize England or to prevent England from receiving help from overseas. Although potent, its aid was not enough to enable the ground forces to "knock out" Russia. Thus the land power, supported by aggressive air power, failed to conquer Eurasia.

Great Britain

In Mahan's opinion, Great Britain possessed in full the characteristics vital to the development of strength at sea. Command of the sea was the cornerstone of Britain's strategy in peace and war alike. But a number of factors began to weaken the British power structure: the emergence of the Commonwealth system, the growth of great powers outside the European sphere (the United States and Japan), the sea power of the United States and Japan, and above all, the rise of air power. While the submarine threatened seriously the British command of the seas during World War I, the combination during World War II of the submarine and air power opened the British Isles to attack even if British command of the seas obtained. But the lessons inflicted upon Britain during World War I were not lost. British strategy replaced the traditional emphasis on sea power by a military strategy in which first place was given air power,⁹ and it was this air power which saved Britain in 1940. Britain joined the United States in employing air power as a means of defeating Germany and of achieving the reconquest of Europe. Since World War II, air power is considered the first line of defense of Great Britain. And Britain has recognized that her survival as a sea power, in relation to the other members of the Commonwealth and the Americas' depends upon her ability to control the air as well as the sea along all vital international routes.

The United States

The inability of Great Britain and France to stop Germany in World War I forced the United States to restore the balance of power in Europe in 1917-18. Having restored the situation as it affected American security, the United States reassumed its traditional isolation from global affairs, favored in the previous centuries by the *Pax Britannica* system, and based on the domination of the seven seas by the greatest of all sea powers—Great Britain. When the war ended, it was officially concluded that air power had introduced no

⁹ D. E. Smith, *op. cit.*, p. 17; Winston Churchill, *The Second World War* (Boston, 1948), II, 88.

outstanding changes in the requirements of American security and that, in event of another war, air power would play a minor, auxiliary role. But the spectacular victories won by Germany in the initial stages of World War II with their air force-panzer combination forced America to change its mind. "By July 1943, the official American estimate of air power had changed to the extent that it was held to be the equal of land power and sea power in comprising American national strength."⁷

The growing appreciation of the changes brought about by air power was reflected in American foreign policy. A number of agreements were negotiated with other states for air bases, transit permission for military aircraft, and other advantages which improved the conditions under which American air power could be exercised (the pacts with the Caribbean and Latin American nations, Canada, and the "destroyer-for bases" exchange with Great Britain); Iceland was recognized as an independent state and American troops sent there; and United States bases were formed on the island chain leading to Europe. The defeat of the Axis was accomplished in large part by Anglo-American air power. The atomic bombing of Hiroshima and Nagasaki in August 1945 was proof of how destructive air power had become.

In 1945 the United States military supremacy was based on control of the seas and the air and its ability to produce weapons; it was the most powerful military nation in the world. After the war the United States was slow both in developing jet aircraft and in making the organizational and strategic moves which recognized the new importance and expanded role of air force. Only in 1947, with the establishment of the Defense Department, was the air arm given equal rank with the ground and sea forces. The Strategic Air Command and the Air Defense Command have replaced the Navy as the first line of American offense and defense. The building of air bases around the Soviet periphery, especially since the outbreak of the Korean war, has become a more urgent and pressing task than the building of naval bases.

Russia

Russia, the largest land power today, developed its historic policies on the basis of pressures toward the oceans from its core, Moscow, and on the extension of control over the surrounding areas in Eurasia. This pressure ceased for a while after World War I, due to the weak organization of the Soviet state, to be resumed in 1939. But the Soviet leaders were aware of the need to supplement Russian foreign policy

⁷ D. E. Smith, *op. cit.*, pp. 19-20; citing U. S. War Department, "Command and Employment of Air Power," FM 100-20, 21 July 1943 (Washington, 1943), p. 1.

by air power. They started building bombing aircraft and military air power after 1933. These bombing aircraft were intended to carry out independent air missions, but as the buffer zone between Soviet Russia and Germany was conquered by the Nazis, the Soviets developed tactical air power to support Russian ground forces. During the last 2 years of the war, Russia, with Allied assistance, gained air superiority over the Germans. Since World War II, Soviet Russia has been building up its military air power, placing more emphasis upon ground-support and defense aviation than upon strategic air power—although the presence in Manchuria of hundreds of twin-engined jet bombers as a part of the air support the Soviets have given to the Chinese Communists indicates that this phase has not been entirely neglected.

These illustrations from recent history show the widespread revision of national policies as the full impact of the potential of modern air power has permeated political thought. But the final and most impressive proof of the paramount importance of air power is to be found in the recent behavior of the Soviet Union. Twenty or even ten years ago geopolitics would have staked its reputation as a science that once an aggressive country had obtained control of most of Eurasia, had built a land army greater in offensive power than all the armies of its opponents, and had made itself comparatively invulnerable to sea blockade or attack, that country would be in an unparalleled position to embark on world conquest. The Soviet Union is now in such a position, and indeed she has been for several years. From 1945 to 1950 there must have seemed little reason for going to war, since the Communists were annexing smaller countries by "peaceful" means almost as fast as the digestive system would allow. "Cold War," which in many of its aspects could be interpreted as a device for bypassing the threat of enemy air action, paid off handsomely in those years. But since the United Nations drew the line in Korea in June 1950, Soviet gains have abruptly ceased. For 2 years the gigantic struggle between the democracies and the Communists has been locked in stalemate. This time has been used by the democracies to organize their international defensive alliances and to intensify their rearmament program in an effort to close the gap in military preparedness which the Communists had opened in the years immediately after the war.

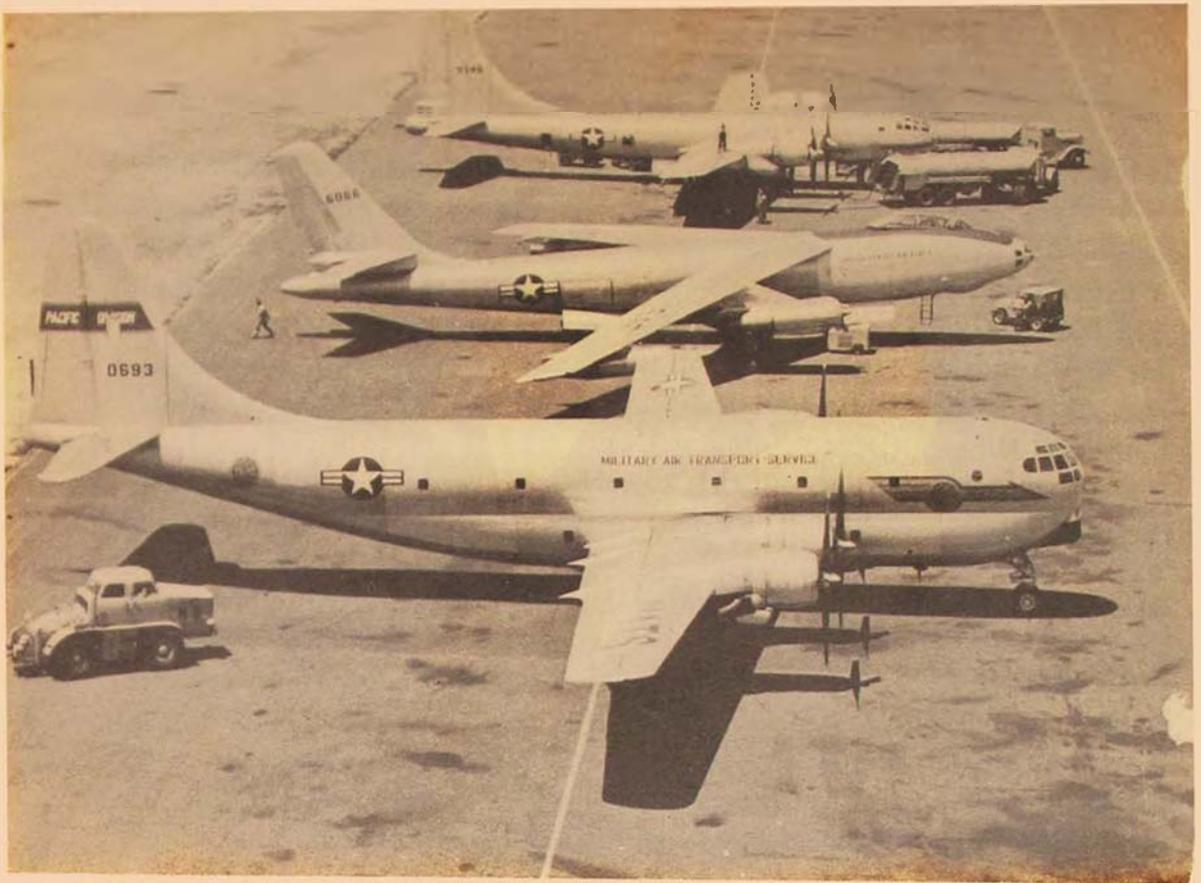
Obviously the Kremlin is aware that its system for bloodless conquest has stalled. It also realizes that with each month which passes, the West becomes more unified and better able to defend itself. Why has the Soviet Union allowed the tide to stop and slowly turn against her? Why did she not attack last year or this spring?

The most logical answer is that air power has upset the traditional weights and balances which enter into geopolitical decisions such as war. The B-47 or the B-36, armed with the atomic bomb, can wreck a substantial portion of the over-strained Soviet industrial system. The modern bomber's speed and its range have reduced to an uncomfortable minimum the protection always previously afforded by the vast reaches of Russian land mass. The Soviet leaders are well aware that the distance between New York and Moscow over the Great Circle route is only 4,800 miles and that the distance between any major city in the United States and any in the Soviet Union scarcely exceeds 6,000 miles. Since the range of aircraft has become almost limitless, here is a weapon which is a major factor preventing the Politburo from using Eurasia as the jumping-off base for its world conquest. Soviet Russia does not want to have its cities and factories and population centers destroyed.

It is true that Soviet Russia has at its disposal the vast Russian spaces for human and industrial dispersal; it might have enough resources to carry on a successful World War III. But it also has to face the fact that, for the first time in history, the "Heartland" can be directly and devastatingly attacked. Hence, geopolitically speaking, Soviet Russia has been trying to conquer the "rimlands" by indirect tactics, either by guerrilla warfare or by fifth-column strategies. It will persistently arm itself and ask the satellites to arm themselves, to be ready when the Politburo sees a chance to strike a lightning blow at the United States from which will appear no chance of retaliation.

Air power has, since the end of the Second World War, rewritten the probable course of international geopolitics. A force has arisen which was beyond the ken of MacKinder and Mahan. It may well be that this is but the beginning of a chain of major revisions in national policy which will be occasioned by man's adaptation to his conquest of the air.

University of Bridgeport



C-97 Stratofreighters like the one shown in the foreground are mainstays of the global airlift, particularly in the Pacific Division of MATS. Rated at over 300 knots and 4,300 miles maximum range, the C-97 can carry a maximum payload of 68,500 pounds or 130 troops or 79 litter patients. One of its assignments is supplying its fighting brothers, the B-47 and the B-50, shown in the background of this picture.

Global Airlift

Global defense of the free world requires a global logistics system with enough flexibility to fulfill continuous commitments and yet meet any immediate requirements for men and matériel. The Second World War demonstrated that an aerial high-priority logistical system could function efficiently only if it had standardized procedures, standardized methods of operation, and centralized top-echelon direction. The Department of Defense has achieved this flexibility and unity through the creation of a single strategic airlift agency, Military Air Transport Service (MATS). Operating 572 transport and 415 other type aircraft over 110,000 miles of aerial routes, MATS now has 142 stations in over 40 foreign countries, as well as 58 locations in the United States. This far-flung network, divided into Continental, Atlantic, and Pacific divisions, enables the strategic airlift to concentrate its capability in any area of the world, reducing to a matter of days the time normally required to get matériel overseas by surface transportation.

Several major tests since its inception in 1948 have demonstrated MATS' ability to rise to the occasion. On 23 July 1948, only 6 weeks after MATS was formed, eight squadrons of C-54's—72 aircraft—were rushed to Europe to join the RAF in the Combined Airlift Task Force which was to conduct the Berlin Airlift. At the height of the airlift a total of 225 C-54's were engaged in direct airlift operations, 75 more in support, and 19 in training activities, in addition to 100 RAF aircraft. By 30 September 1949, this task force had airlifted 2,325,510 tons of supplies and matériel to the beleaguered city. A

second test came in Operation Swarmer, the first peacetime exercise to establish, reinforce, and supply by air an independent airhead deep in enemy territory. A total of 100 C-54 and equivalent aircraft airlifted 15,482 tons and 20,851 passengers in the 4 days of the maneuver. The latest and most extensive test has been the Korean war, where for over 2 years MATS has maintained a steady flow of critically needed matériel and passengers to the Far East and on return flights has provided swift, comfortable evacuation for thousands of casualties.

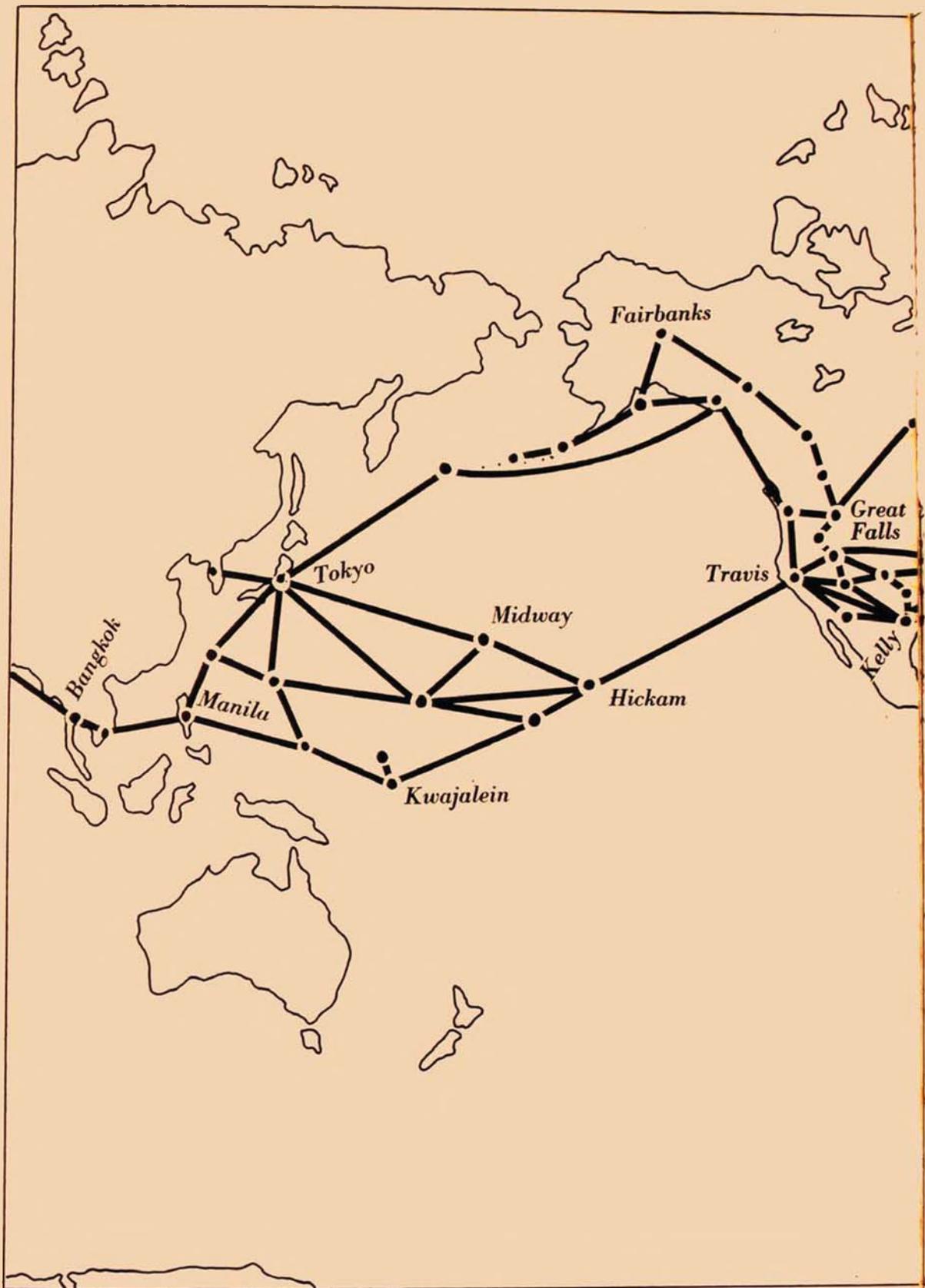
Organized on the nuclei of Air Transport Command and Naval Air Transport Service, its World War II predecessors, MATS was set up 1 June 1948 by directive of the Secretary of Defense. As an integrated command composed of Air Force and Navy elements, it was to provide a single air transport system in logistic support of the three services of the Department of Defense. It was assigned to the Air Force for operational control and it is from the Air Force that most of the aircraft and personnel have been drawn. Ten per cent of MATS headquarters and operations personnel in the field are Navy. The number two man in MATS is a Navy admiral. One of the three MATS divisions, the Pacific, is commanded by a naval officer.

MATS' primary mission is to maintain a flexible air transport capacity for strategic intercontinent and intertheater airlift. Under the jurisdiction of the Joint Chiefs of Staff, the Joint Military Transport Committee receives monthly air transport requirements of theater commands and allocates tonnage on the basis of support priorities assigned the various theaters and of the availability of other means of transportation.

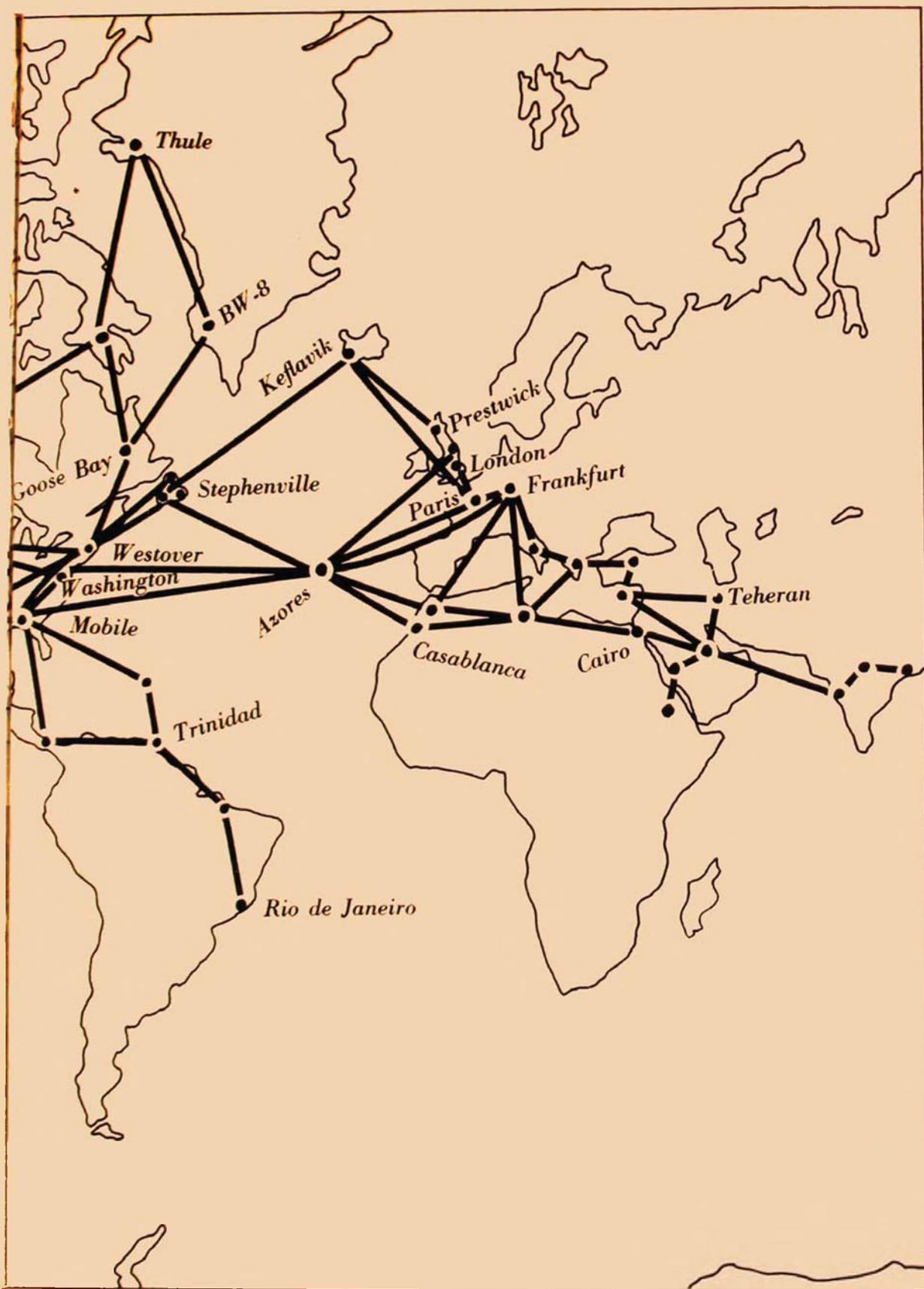
There are six major ZI ports of aerial embarkation, four of which—Washington National Airport, D. C.; McChord AFB, Wash.; Brookley AFB, Ala.; and Great Falls AFB, Mont.—are operated by the Continental Division of MATS. The fifth—Westover AFB, Mass.—is operated by the Atlantic Division; and the sixth, Travis AFB, Calif., by the Pacific Division. Fanning out from these facilities, special missions can be organized on short notice to any part of the country—or of the world—to meet emergency requests for air transportation.

Beyond the Continental Division, strings of bases dot the air approaches to strategic areas the world over. The Pacific airlift supports operations in Alaska, Japan, Korea, Oceania, and Southeast Asia, with PAE's at Travis and McChord AFB. The North Pacific route from McChord to Tokyo, the shortest trans-Pacific route in air miles and flying time, covers 5,704 miles and some 33 flying hours. From Travis, the Central Pacific route through Hickam AFB, Johnston Island, Kwajalein, Guam, and Tokyo involves a distance of 8,073 miles and some 40 flying hours. Shuttle flights extend the Pacific Division area to Manila, Saigon, Bangkok, Calcutta, and Dhahran.

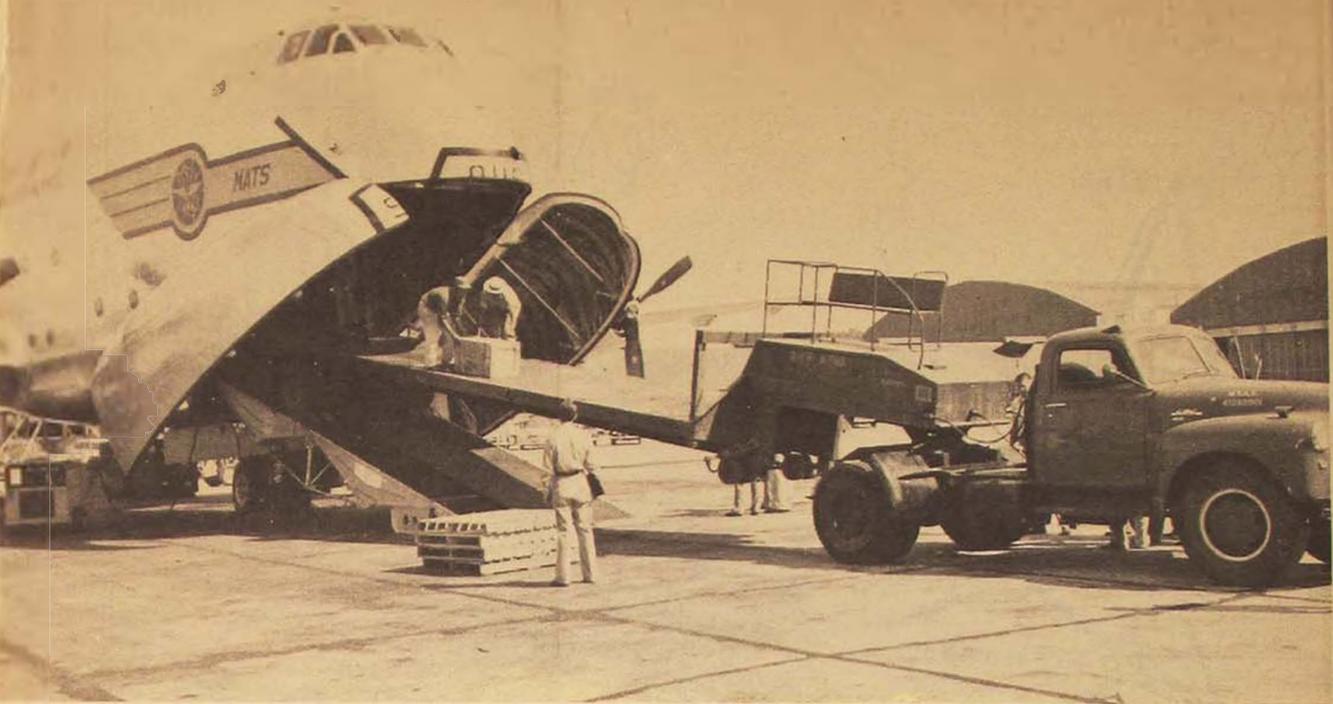
The Atlantic Division operates routes to Prestwick, Scotland; and Burtonwood, England; with stop-overs at Stephenville, Labrador; and Keflavik, Iceland. Monitoring stations and Airways and Air Communications Service outposts in Greenland and Baffin Island are likewise serviced by this division. Farther south, Tripoli-based planes shuttle between Dhahran and Tripoli, and to various other points in Europe, Africa, and the Middle East. Problems involved in extended over-water operations include distances in nautical miles and flying hours, climatic and physical variables during the flight, effectiveness of communications, and availability of appropriate aircraft for the mission at hand. (Information provided by Hqs., MATS; photographs furnished by MATS and Pan American Airways.)



Like a spiderweb, Military Air Transport Service's global airlift routes spread out over most of the free world. Shown here are the more important of the 200 stations maintained in 42 countries and within the boundaries of the United States.



Divided for operational control into three major divisions—Atlantic, Pacific, and Continental—and six supporting services, MATS is charged with providing strategic intercontinent and intertheater airlift support for all United States defense forces.



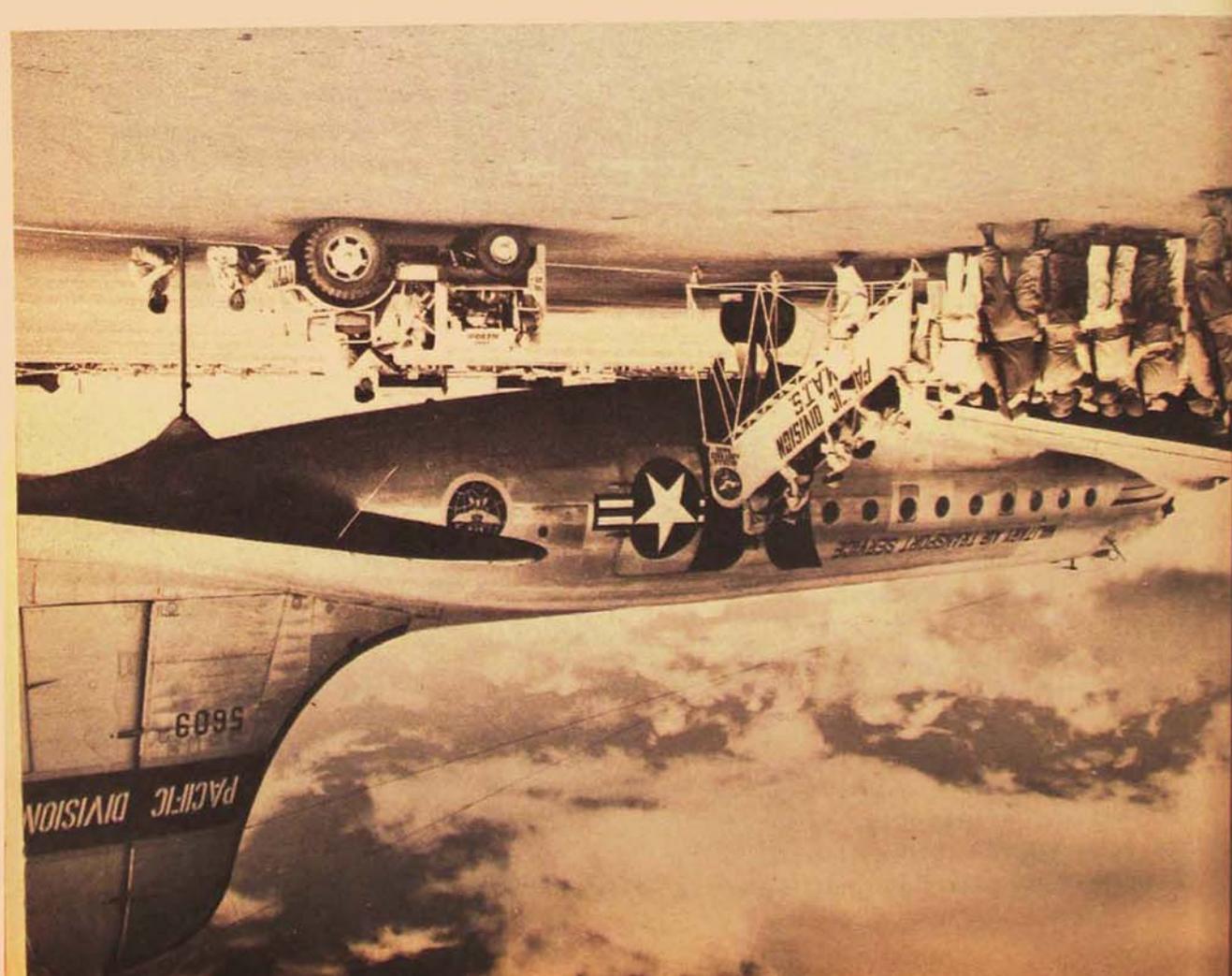
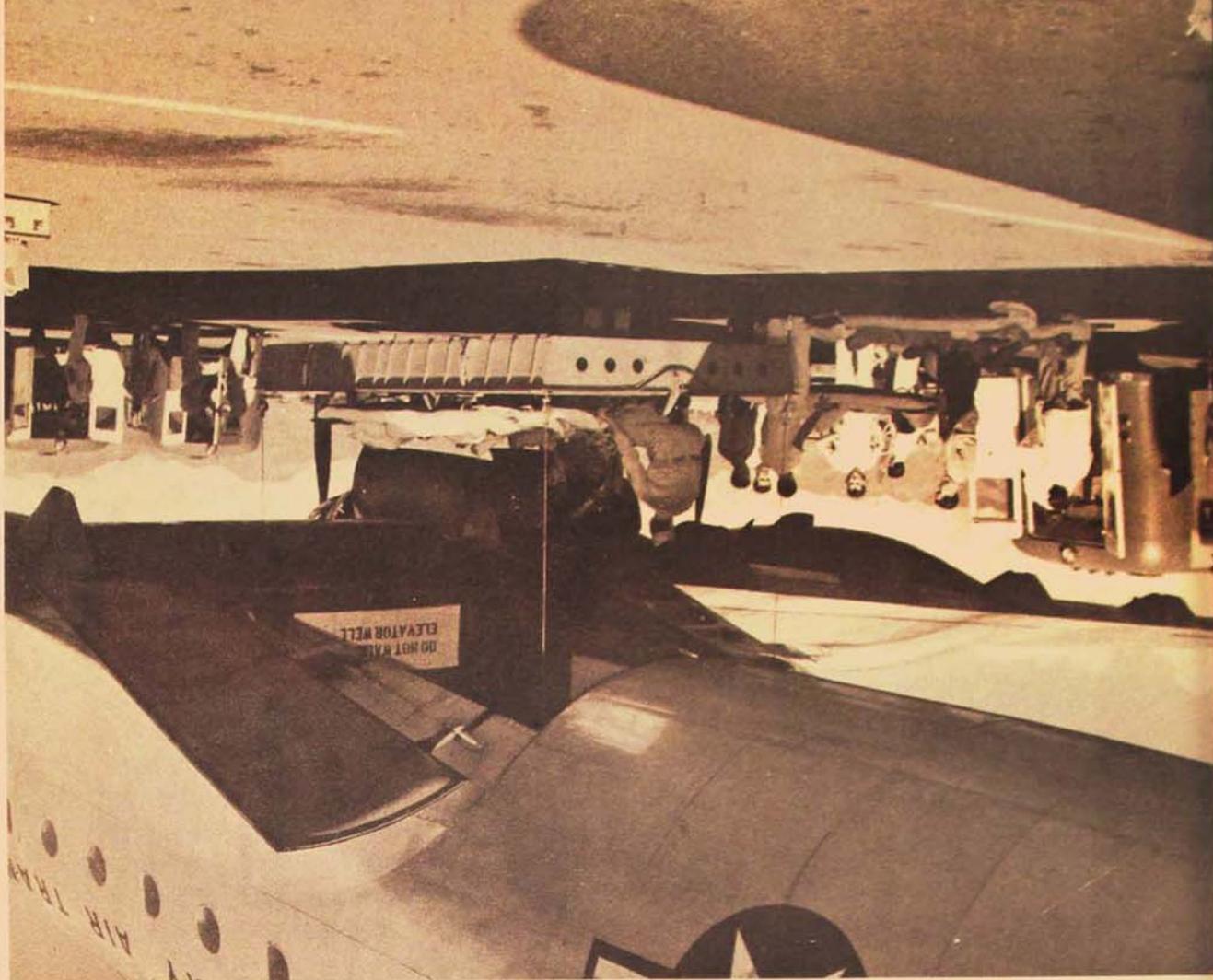
This C-124 Globemaster has a design payload of 74,000 pounds, and in a recent test carried 70,000 pounds on a 2,000-mile-flight. Its 12-foot high, 12-foot-wide, 77-foot-long cargo compartment can hold almost all types of vehicles used by the armed services, including light tanks. Clamshell doors and hydraulic ramp and built-in electrically operated cranes speed loading and unloading of heavy or bulky cargo.

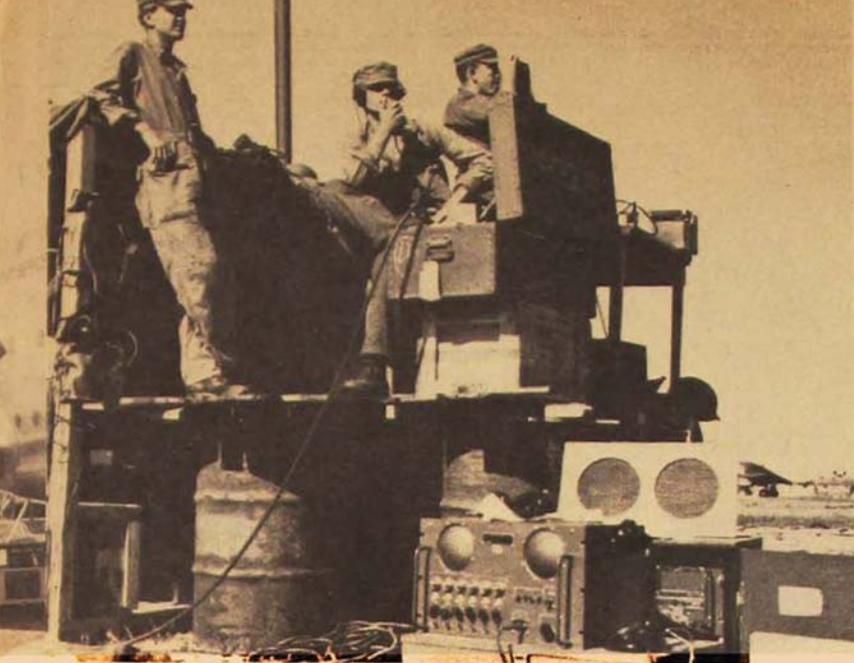
Main Functions

In carrying out its role in the global logistics network, strategic airlift provides world-wide flexibility of operation and shortcuts the normal supply pipeline. Its three major categories of operation are the transportation of critically needed freight, quick transfer of personnel, and speedy evacuation of casualties.

Between 1 June 1948 and 1 January 1952, the strategic airlift transported to and from Atlantic and Caribbean points of destination 225,545 passengers and 39,375 tons of cargo and mail. In the Pacific the total was 314,000 passengers and 66,000 tons of cargo and mail. Through March 1952, 22,921 litter and 16,129 ambulatory patients had been returned from Korea for hospitalization. From 1 June 1948 to 1 March 1952 MATS aircraft flew a total of 2,257,717,688 passenger miles and 620,154,668 ton-miles with only four fatal accidents in its world-wide scheduled aerial transport operations.

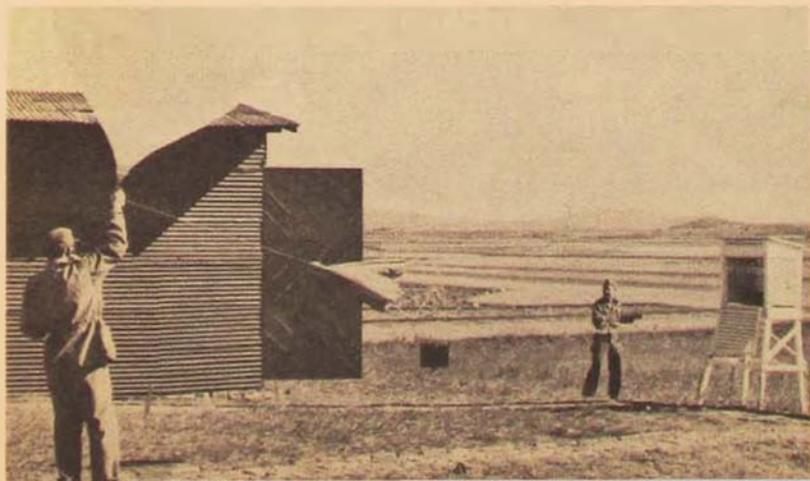
A C-54 Skymaster of the Pacific Division of MATS is shown (right above) at Hickam AFB, Hawaii, as it takes on passengers for Japan and Korea. Like other MATS transports, the C-54 can be quickly converted from a freighter to a passenger or hospital aircraft. The third function of the strategic airlift is shown at the right. Ringed with ambulances, a C-74 Globemaster I is being loaded with litter patients ready for the long flight across the Pacific from Hickam AFB to the United States. The built-in elevator gently raises the patients into the main cabin, expediting the loading of as many as 109 litters into this huge flying ambulance. The hospitals in the United States are only 40 flying hours away from Japanese take-off points.





Another part of the mission of the strategic airlift is to act as custodian of certain isolated bases necessary to maintain global air routes. To operate these bases and to provide efficiency and safety of operation over the 110,000 miles of aerial routes, expert support services have been formed in communications, weather, flight planning, air

The Airways and Air Communications Service provides 1,251 facilities from some 230 strategic locations around the globe, operating 16 different kinds of communications and navigational devices. AACS men are shown above operating a makeshift control tower at Kimpo, Korea. At right a Flight Service Center, which provides clearance authority and movement messages, and informs other AF agencies on aircraft identifications.



At left men of the Air Weather Service are about to release a Rawinsonde balloon to record upper air conditions. Data from such stations in 18 foreign countries, supplemented by the observations of six aerial weather reconnaissance squadrons, are relayed to master weather centers which use this as a basis for both operational and advance forecasts on a global scale.

rescue, aerial resupply, and charting and mapping. These services are operated by MATS for the USAF since they function either in support of its primary mission or as extensions which carry its operations to their logical conclusion. Of course the facilities of these services also operate in support of other commands and of the allied forces.



The two wings of the Air Resupply and Communications Service will prepare and disseminate (shown above) propaganda materials and will resupply isolated units on the ground. At left, a crew of the Air Photographic and Charting Service is filming a training movie at Williams AFB. In addition to Air Force still and motion picture photography, APCS handles the world-wide charting and mapping program of the U. S. Air Force.

Using modified bombers, amphibians, helicopters (as at right), and cargo aircraft, Air Rescue Service airlifts wounded soldiers to safety and picks up airmen downed behind enemy lines. Larger MATS transports then ferry the casualties to the U. S. ARS facilities are available for use by foreign countries. Like the other MATS services, it trains its own personnel.



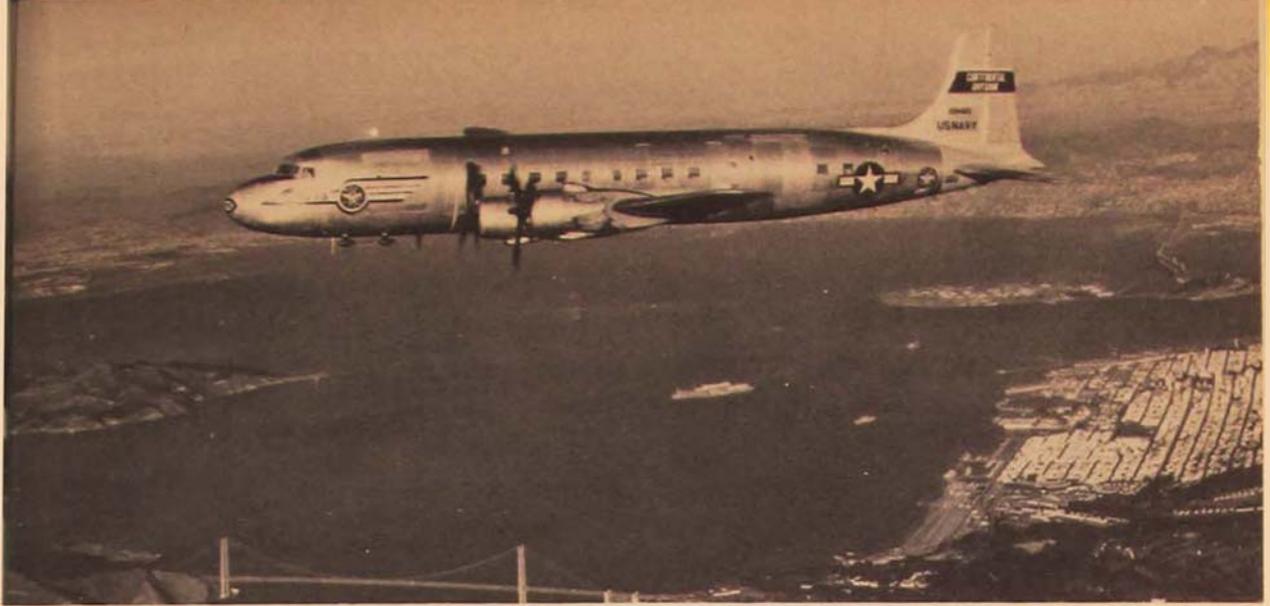


Two types of civil aircraft made available to the strategic airlift are shown in this photograph. The huge Stratocruiser (military designation C-97) loading in the foreground carries a maximum cargo of 68,500 pounds or 130 troops or 79 litter patients and four attendants. The Skymasters (military designation C-54) in the background will each carry 31,700 pounds or 49 passengers or 36 litter patients.

When the Korean war broke out in 1950, the airlift to Japan had to be quickly and substantially increased. MATS responded by diverting 40 four-engine transports from the Continental and Atlantic divisions. Two Troop Carrier groups were assigned to MATS. Simultaneously MATS called upon the commercial carriers to make four-engine transport aircraft available to the government for contract service on the Far East airlift. The commercial carriers responded immediately. On 3 July, 1 week after the Korean conflict began, the first charter flight left Travis AFB for Korea. During the next 2 months 66 aircraft from scheduled and nonscheduled carriers were phased into the Pacific airlift operations. In addition to American airlines, the Royal Cana-

The old reliable DC-3 Skytrain (military designation C-47), shown below, is the most widely used transport aircraft in the world. Carrying a maximum load of 7,500 pounds, 21 troops, or 18 litters, it is used on the shorter trips within the Continental Division of MATS and on the shorter shuttle flights in or between overseas theaters.





The DC-6A Liftmaster (USAF designation C-118A; USN designation R6D-1) is 5 feet longer than the original DC-6, and is the freight-carrying twin of the DC-6B widely used as a passenger aircraft by commercial airlines. With a cargo capacity of more than 12 tons and space for 74 passengers or 60 litters, it cruises at over 300 knots for up to its 4,910 miles maximum range or for its 3,860 miles normal range.

dian Air Force and Belgium's Sabena Airlines also contributed aircraft through the United Nations. Today this reserve fleet of civil aircraft is airlifting the bulk of tonnage to the Far East, as MATS has shifted its own aircraft to maintain other national commitments throughout the world. On the basis of this experience, a plan has been drawn up for maximum use of civil as well as military aircraft in future emergencies. The "Civil Reserve Air Fleet Plan" calls for the immediate contracting of 400 civilian four-engine aircraft to MATS in cases of all-out war. Many of these aircraft are now being modified so that they will be immediately available or in standby reserve for MATS in case of emergency.

The Constellation (military designation C-121A) also has a widely used civil counterpart to the military version. With a cargo of 49,280 pounds or carrying 64 passengers, it cruises at over 300 knots. The C-121C now on order for the USAF will be 18.4 feet longer than the C-121A and similar to the new commercial Super-Constellation.



In My Opinion . . .

AN AIR GUARDSMAN'S POINT OF VIEW

MR. MYRON G. H. LIGDA

IN Colonel Schriever's article, "Organization and Training of the Civilian Components," in the Winter 1952-52 issue of the *Air University Quarterly Review*, the author ably and convincingly restates the Air Force plea for an integrated, federally controlled Air Force Reserve program. At one time I was in hearty agreement with Colonel Schriever's thesis for an integrated reserve program, but on the basis of personal observation and experience I have since revised my opinions on certain points which most Air Force spokesmen apparently refuse to recognize or do not care to discuss. I would like to emphasize that the opinions and beliefs set forth here *are entirely my own* and do not necessarily reflect those of my fellow officers in the Massachusetts Air National Guard. On the contrary, I have no doubt that many Air National Guard officers of much greater competence and experience than I favor integration.

Many Air Guard men, including myself, regard the regular establishment (as we sometimes refer to the Air Force) with some suspicion and oppose federalization of the Air Guard because of the Air Force's postwar administration of the Air Reserve program. When the guardsman and reservist compared notes (this was at company grade level in my own case), the scales invariably tipped in favor of the guardsman in regard to pay, training facilities, promotion opportunities, assignment to a definite job, and so on—practically ad infinitum. As to the differences in the program at the enlisted levels, nothing need be said. It was painfully evident that the Air Force, concerned with its own immediate postwar expansion problems, could devote little time or funds to the benefit of its own Air Reserve. The few officers it did assign to administer the program made heroic efforts (I attended many reserve meetings and I know), but despite these, many reservists who attended meetings for months without pay or assignment to duty at last became discouraged and became inactive or joined the Air National Guard. In view of this, is it any wonder that so many Air Guard men do not wish to see their program and budget brought under direct Air Force administration and control? As has been amply demonstrated in the past, if the regular establishment runs short of funds the reserve program suffers first.

In Colonel Schriever's article the case is cited of a Troop Carrier Wing (Air Reserve) which experienced many unforeseen difficulties in becoming combat operational. This was a unit over which the Air Force presumably had direct and immediate control. Evidently the Air Force, at least in this case, was not able to train even their own reserve unit adequately. I am not saying that activated Air Guard units experienced less trouble upon federalization, but does the experience of this particular wing constitute a convincing argument for assignment of the entire reserve program to the jurisdiction of the Air Force? If the Air Reserve program had been a model of efficiency which could have been used to demonstrate the shortcomings of the Air Guard, a good many people would lend a more sympathetic ear to the Air Force plea for reserve integration. I think that the truth of the matter is that the Air Force is simply incapable at present of conducting a reserve program which would bring the units to a satisfactory level of readiness. While plans are suggested in Colonel Schriever's article to correct the situation, I do not think they need include federalization of the Air National Guard to demonstrate their worthiness.

There is a much more fundamental objection to the integration of the air reserve forces of the United States under a single command. Colonel Schriever mentions the need for caution on the part of policy makers for the civilian components when presenting their case to the Guard units. He says: "it must be stressed that . . . recommendations are not the result of a whim or a power complex of the Air Force but are submitted out of a deep concern that the United States Air Force be fully capable of defending our country."

The point is very well taken, and no guardsman, least of all myself, will argue that the Air Force does not have a keen realization of its responsibility in the defense of our country. But it is going to be exceedingly difficult for the Air Force to demonstrate that it does not have a "power complex." There exists entirely too much evidence to the contrary in the past record of (1) the Air Force efforts for equal standing with the Army and Navy; (2) the Air Force-Navy fight over who should control naval and marine air forces; (3) the Air Force-Army dispute on whether the Army should be permitted to operate and control its own ground support and observation aircraft; and (4) the past record of the Air Force in attempting to gain control of the Air National Guard.

It cannot reasonably be denied that these campaigns represent at least some "inclination" toward a power complex. No doubt it stems from the highest motive and desire of the Air Force to carry out its assigned mission to the very best of its ability, but it is *not* agreed upon

by all that control of the air power of the United States can be safely concentrated in a few hands. When the Air Force attempts to deny a power complex which it so patently exhibits, its other protestations become suspect and its case is damaged badly and needlessly.

The real argument is not whether the Air Force has such a complex, but whether the defenses of the country are best handled in a manner which the Air Force advocates. On the surface the gain in administrative efficiency is clear cut and can hardly be disputed. But the whole concept is based on the rather shaky and dangerous premise that "we know best," and therefore the control, training, and application of United States air power should lie in the hands of a single group or organization within the Air Force. While in direct opposition to the philosophy of the National Guard establishment as set up by the wisdom and foresight of our founding fathers, this is also a dangerous proposition in that miscalculation in planning, administration, or conduct of the air power program may have profound and far-reaching consequences. That the Air Force is perfectly capable of making miscalculations and errors of judgment can easily be illustrated. For example, why was the Air Force so severely criticized in early phases of the Korean conflict for the lack of adequate air support to the ground troops? Why have all inactive Air National Guard units been stripped of their jet aircraft? Was it because the Air Force, bemused and occupied with the grand concept of a huge "global strategy B-36-atom-bomb" program, failed to foresee the possible long-range requirements of the more prosaic, less glamorous ground operations, and as a consequence was caught short in properly trained personnel and tactical aircraft? * Not but that such a miscalculation is understandable (after all, who *did* foresee the Korean conflict) but that the consequence of such an error could have been greatly magnified if the Air National Guard had been already assigned to Air Force control, stripped of its equipment, and relegated to troop carrier and transport missions. Perhaps it might

*WHILE THE Editor is glad to print Mr. Ligda's stimulating comments, he cannot accept such charges as the ones made against the Air Force in this paragraph without pointing out that the author seems to operate on the premise that any extended criticism of the Air Force is valid. The Air Force is confident that the verdict of history will uphold its concept of the use of air forces in close support of ground troops. Its case has been ably presented by Dr. Albert Simpson, "Tactical Air Doctrine—Tunisia and Korea," *Air University Quarterly Review* (Summer 1951), IV, 5. As for the bemused Air Force overlooking tactical aircraft in favor of the more glamorous B-36-atom-bomb program, we need but refer the author to consideration of the drastically reduced defense budgets in the years 1946-50. It was decided by the Department of Defense, not by the Air Force alone, that strategic air forces should be given the highest priority of any branch of any of the services because it was recognized that the retaliatory capability of the long-range air forces was the greatest deterrent to war at that time. And even so, in the early stages of the Korean war to which Mr. Ligda refers, there were sufficient tactical air units to meet the requirements of the number of army units in being. *Editor.*

even have been left to wither on the vine as its allocated funds were drawn off to purchase and maintain more heavy bombers.

I do not bring up these points for the purpose of criticizing the Air Force, which is obviously doing a magnificent job under tremendous difficulties. I repeat my point is that Air Force commanders, being human, can and have made erroneous decisions. So can and have those of the Army and Navy—and the National Guard. However, in independent forces, reserve or regular, we have commanders whose careers are not dependent upon their falling in line with the opinions and wishes of the hierarchy of another force. Within the properly limited sphere of independent action permitted the National Guard authorities, these men can exercise free thinking and action which provides a degree of safety factor in case a fundamental error in planning is made by another force. Admittedly this may be a costly, fumbling way to do things at times, but then so is a democracy fumbling compared to a dictatorship. Let it be noted that the principle of freedom to act independently was one of the most persuasive arguments for the establishment of the Air Force itself.

The Air Force as a whole is officered by highly able, intensely patriotic men for whom I have a great deal of sincere admiration and respect. These men within their lifetimes have seen and overcome much opposition to their ideas and plans. Naturally enough, many of them, because they have been so frequently vindicated, are inclined to discount the worth and validity of applications of air power which are to the slightest degree contrary to their own. Apparently to these officers the existence of an independent reserve force is exceedingly irksome. It seems to present a tangible obstacle to their plans and therefore cannot be tolerated. I cannot hope that this paper will cause a revision of this attitude, but I can hope for a reassessment of the value of such an independent force. Since it looks like the Air National Guard is going to retain its autonomy for some time, why not exploit the advantages of the situation to the maximum?

Let us consider some of the factors which arise in the organization of an "adequate" reserve program. Reservists, taken as a whole, may be roughly divided into three main categories. In the first category will be found those who can devote much more time than the others to reserve activities. These men have largely found that the Air Guard can provide a program which will absorb their spare hours; they also provide the backbone of the Air Reserve program. The second category is composed of those who have a lesser amount of time which can be spared for this purpose. These reservists have usually found that the Air Guard requires too much outside activity and have accord-

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ingly reverted to or remained in the active Air Reserve. In the third category are the men who wish to remain affiliated with the air reserves but can devote so little time to this activity that they must necessarily remain on the inactive lists. This group is not to be slighted or neglected in any way. They constitute an exceedingly valuable talent pool and their interest in the Air Force is to be solicited.

The organizers of any realistic reserve program must recognize this situation and provide for it. These planners must also recognize that many reservists, while entirely willing to be recalled for extended active duty when national emergency (as proclaimed by the President and Congress) so requires, nevertheless demand assurance that if such emergency does *not* exist they will not be involuntarily recalled on some whim of the Air Force or to alleviate a temporary condition which may arise from time to time in the regular establishment. While to the best of my knowledge the past record of the Air Force is not bad in this respect, the recall program which left many air reservists in a highly uncertain position in the last few years has reflected little credit on the consideration of the Air Force for the particular problems of the individual. This demonstrated attitude will probably cause many guardsmen to sever their relations with the reserve program if the Air Guard is brought under direct federal control. I admit this is a selfish attitude, but it is a factor for serious consideration.

While, as I have indicated, I am not in sympathy with a unified and federalized Air Force Reserve, I have a suggestion on how this might eventually be established. Since direct frontal attack in the form of proposed new legislation has failed (admittedly because of the powerful political influence which the National Guard Association brought to bear), other less direct approaches seem indicated. I would suggest that the Air Force create a reserve of a caliber which would excite the envy of the Air National Guard and would attract men to it by preference. Granted that this will take time, money, equipment, and a great deal of effort. It would require far more than mere lip service and alluring recruiting posters. With such a program *in being*, the Air Force would have a much more legitimate basis for the argument that it could handle the Air National Guard program better than is currently being done. I do not guarantee the success of such an undertaking, for the Air Guard might just possibly be spurred on to even greater efforts to demonstrate that Air Force control was unnecessary. But at any rate it is worth a try.

Then there is the old saying "if you can't lick 'em, join 'em!" I do not advocate integration of the Air Force into the Air Guard, but rather a more sympathetic and understanding approach by the Air Force to the unique problems and difficulties of the reserve program in

general and to the Air Guard in particular. Attempts to destroy the autonomy of the Air Guard by the methods used so far have not won the Air Force many friends in the former organization.

The Air Force has an excellent opportunity to reorganize and reconstruct their reserve program *now* as the first reservists are being released from the extended active duty made necessary by the Korean war and while the whole reserve program is more or less dormant. I believe that unless drastic reorganization is undertaken—perhaps along the general lines proposed by Colonel Schriever—the Air Force stands to lose many reservists who will not care to be caught a second time.

AN AIR FORCE SUGGESTION PROGRAM

COLONEL LOWELL G. SIDWELL

ONE KEY to morale is the degree of personal importance enjoyed by the members of any organization. If the conditions surrounding the work of the individual make him feel that he “belongs,” that he “counts,” that his fellow workers and his superiors look upon him not only as a producer but also as an intelligent human being, the morale of such an individual will be high. Anyone’s self-respect depends largely upon the respect which others show toward him.

Perceptive managers have shown more and more interest in raising morale by encouraging individual participation in matters of operating procedure and methods of production. Many concerns use the suggestion system for this purpose. Their experience indicates that this method may tap a reservoir of ideas, ideas that frequently suggest valuable improvements both in work processes and working conditions.

The various suggestions adopted by the Air Force have already resulted in tremendous savings. The civilian program from 2 June 1943 through 31 December 1945 provided 15,557 new ideas and methods which saved the Air Force an estimated \$57,313,687.50. The military program from 1 June 1944 through 31 December 1945 furnished 1,552 additional ideas which saved an estimated \$1,757,716.19. Most impressive to management have been the stores of latent energy and productive cooperation which could be obtained from the working force under the right conditions. When adopted and given due recognition, such contributions will obviously add to the individual’s sense of partnership and personal worth. His increased

interest and his identification with the organization is stimulated by the fact that he now has an outlet for his grievances.

And there are additional advantages from the standpoint of personnel administration. One of the tragedies of our society is the human failure to recognize ability and potential leadership where it exists. A properly functioning suggestion system can offer a means of bringing to light such capacities so that they can be more fully used through transfer or promotion. Finally the suggestion system and its administration can be a valuable educational and training medium. A British public administrator pointed out this aspect of the suggestion program in the British civil service:

Even supposing the suggester in the ranks has nothing substantial to contribute on the present occasion, at least if he is treated wisely, he will have learned something from the discussion of his idea which will have taught him what the criteria of advantageous change must be and what sort of facts and figures are necessary in order to prove one's case.*

The Air Force has a good basis for an over-all suggestion system in the *Unsatisfactory Report*, a very useful channel whereby the operating units of the Air Force report failures of equipment, discrepancies in systems and procedures, or errors in forms and publications relative to matériel. These informal reports may be initiated by any individual assigned or attached to the Air Force when he observes unsatisfactory conditions. These reports from every part of the Air Force are processed by Air Matériel Command, Maintenance Division. One glaring fault of this system from a personnel management point of view is that individual reports are answered either in a new Technical Order covering the suggested change or in the periodic publication known as the *UR Digest*. The individual's commanding officer very often sees to it that proper personal recognition is given, but this practice is not universal. Also the most valuable suggestions may be those that could be applied to the entire Air Force rather than to a limited section or procedure. The commanding officer may have no knowledge of the possibilities of over-all application and thus may not be able to judge the importance of any one suggestion. Some centralized agency is desirable for handling such problems.

Any study of expanding the province of the *Unsatisfactory Report* to serve the need for an Air Force suggestion system must answer three general questions: (1) the scope of the plan—whether it is to be limited in any respect; (2) the type of recognition to be accorded

*Myra Curtis, "Treatment of Suggestions from the Staff," *Public Administration* (London, April 1934), XII, 168-177.

those making constructive suggestions; (3) the administrative machinery and procedures.

Scope involves two considerations—who should participate and what areas of Air Force activities should be subject to a suggestion program. As to the first problem, the general rule should be that no individual who is already responsible for planning should come within the scope of the suggestion scheme. For such people there are already satisfactory outlets in staff meetings and the like.

A more puzzling question is the one of limiting the subject matter appropriate to suggestions. From both the theoretical and practical standpoints, however, it seems undesirable to restrict the scope of suggestion by any formal means. Not only is it all but impossible to draw the line between what are properly staff concerns and what are not, but the very attempt smacks of an effort to maintain managerial prerogatives. Such an approach is certainly not the one best calculated to stimulate the widest cooperation. Moreover, in the actual administration of the plan, impractical suggestions can be disregarded without any formal limitation.

Proper recognition of those people making worth-while suggestions is a prerequisite of a successful policy. Various methods might be employed which will provide effective incentives. For example, commendation for a good suggestion may be entered upon the airman's record and thus be taken into account in promotion. Or the suggester may be given public recognition for his contribution by citation on the bulletin board, the organization newspaper, or by a grant of additional leave. But the most effective incentive has been found to be a direct financial reward. The latter method has been used by the Air Force in rewarding civilian employees for some years and has been sporadically or locally applied to military personnel.

Finally there is the question of the administrative machinery to be provided. A committee to evaluate suggestions on each Air Force base would serve as a guarantee of fair treatment and would arouse interest in the project as a partnership affair. The final decision as to the adoption of a particular suggestion should rest with the head of the department concerned. Those suggestions which showed promise of benefit to the Air Force as a whole could be referred to a central reviewing authority just as Air Matériel Command now acts upon the *Unsatisfactory Report*.

A further function of the local committee would be to stimulate the free use of the privilege of making suggestions. A well-managed system which personalized its contacts with suggesters, particularly those whose suggestions are not approved, can become one more means of building and retaining morale and cooperation in the Air Force.

It provides a method for stimulating individuals to submit ideas, a channel for receiving and appraising them, and an authoritative agency for recommending those ideas which are worth while and applicable.

A criterion for acceptable suggestions might require that they achieve one or more improvements in defined areas:

- (1) saving in labor supplies;
- (2) elimination of delay in handling situations;
- (3) improvement of equipment;
- (4) elimination of unnecessary records or data;
- (5) elimination of unnecessary operations;
- (6) confining necessary operations to a smaller number of people;
- (7) improvement of training procedures;
- (8) improvement of organization.

A program such as the one proposed, based as it is on an expansion of a proven Air Force management technique, should prove of great value to the Air Force both in better morale and in more economical procedures and equipment. But a suggestion system will be of value only if it induces individual cooperation and participation. It is necessary to make it plain to everyone, first, that suggestions are seriously desired and, second, that they will be accorded careful attention and appropriate recognition.

Strategic Air Command

NATO Activities

THE NATO DEFENSE COLLEGE

VICE-AMIRAL D'ESCADRE ANDRE GEORGES LEMONNIER

THE preamble to the North Atlantic Treaty states:

The parties to this treaty reaffirm their faith in the purposes and principles of the Charter of the United Nations and their desire to live in peace with all peoples and all governments.

They are determined to safeguard the freedom, common heritage and civilization of their peoples, founded on the principles of democracy, individual liberty, and the rule of law.

They seek to promote stability and well-being in the North Atlantic area.

They are resolved to unite their efforts for collective defense and for the preservation of peace and security.

This treaty does not form an old-fashioned military alliance. Under its articles measures have been taken to develop in peacetime the individual and collective capabilities of the member nations to resist attack. Among the measures agreed to is the establishment of an integrated force under centralized control and command. Not that the treaty is simply a defensive instrument. It provides for armed intervention by its members no matter from what direction or by whom an attack is made upon a member. NATO is not explicitly a regional arrangement, nor must the member states border on the Atlantic, nor is it directed against any specific nation. The NATO Treaty has stated a new concept for modern times, which provides peaceful nations with the means to place themselves collectively in the best position for defense. This has resulted in the establishment of several allied commands in time of peace, the first such in history.

This association of nations will have effects more far reaching than a purely temporary arming for the purposes of meeting an immediate threat. For that reason there are numerous suggestions and studies looking toward nonmilitary activities within the framework of the North Atlantic Treaty Organization. The world press and the statesmen of 14 nations have made it clear that NATO defensive arrangements are calculated to build strength. Nonmilitary activities have received less attention and have made less progress because of the complexity of economic and financial matters and the continual effort to prevent overlapping of NATO functions with those of the subcommittees of the United Nations.

The NATO Defense College is an instrument of the defensive side of the treaty. Its objective is to provide trained officers of broad

military and international background for duties on higher staffs and as senior commanders in the future. Certain civilian officials are also members of the classes. It is expected that they will, if they return to their national agencies, be involved in NATO matters in the future, and when they serve international groups that they will, assisted by their course of studies at the College, be able to contribute materially to the success of NATO.

Specifically, the purpose of the College is to afford selected personnel the opportunity to study: (1) the organization and aims of the North Atlantic Treaty and the major factors in NATO defense; (2) the problems concerning the preparation and conduct of the NATO forces in war; (3) the organization and working of NATO bodies and staffs.

The NATO Defense College is unique in that it is the only international joint defense college presently in existence. Greater emphasis is placed in the curriculum upon the military factors of the defense organization than upon the civil aspects, but the promotion of understanding of the economics and the politics within the nations is also stressed. No single armed service receives greater emphasis than do the others. Every effort is made to insure a full understanding of teamwork among the armed forces and between the armed forces and the civilian components of NATO. All problems and all instruction are pointed toward the international aspects of the interservice functions of NATO. The College is an academic institution. It is not a planning or operating staff nor is it affiliated with any such staff. The College is not authorized to know or to teach the operational plans presently prepared or under consideration by SHAPE or the other NATO commands. Problems involving planning are designed to provide instruction in the basic elements of international planning and are not for the purpose of preparing, even tentatively, actual operational plans.

In the spring of 1951, the Supreme Allied Commander in Europe became convinced that a trained international nucleus of staff officers and commanders was prerequisite to the easing of the personnel problem for his and other NATO headquarters. He therefore wrote to the NATO Council, asking that a College be established, that it be directed to provide instruction to senior officers and civilians slated for future duty in the higher NATO staffs and committees, and that it be international in character. As a result an advisory committee prepared a suggested draft of the general subjects to be given at the College and gave broad guidance on its operation. The first meeting of personnel assigned to the College took place in mid-August. A tentative lecture schedule and a tentative list of problems were drawn

up. Another meeting was set for mid-September, by which time it was hoped that all of the senior instructors would have been nominated and would be present in Paris, and that the final outline of studies could be completed. It was also agreed that the first course could start on 19 November 1951.

Meanwhile the alteration of one of the Ecole Militaire buildings at 21, Place Joffre, Paris, was proceeding. The area in which the College would be placed had been used as dead storage for archives dating back at least to World War I. These were cleared out, an intermediate floor was built, and the construction of the general meeting room and of the lecture room was undertaken. Most observers agreed that the mid-November date was optimistic but that it could probably be met.

The mid-September meeting was held with all senior instructors present. The bulk of the outline for lectures was completed and the general themes of certain of the problems were determined. The governments of the member nations were requested to nominate the members (students) for the first course and the officers designated as instructors were notified to be in Paris ready to work on 16 October. The instructors assembled on that day in the as-yet uncompleted College and started the task of preparing the problems and procuring the necessary material to begin instruction to be undertaken on 19 November.

The College is divided into an administrative and an academic section. The administrative personnel is provided largely from French sources. The academic personnel for the first course came from the member nations of the Standing Group: France, the United States, and Britain. These arrangements, purely mechanical, were adopted to allow the College to open on short notice. After the first course it is expected that other nations will provide a proportion of the overhead personnel, including instructors.

The College functions under the Military Committee of NATO through its executive agency, the Standing Group in Washington. Its authority and permission to undertake any particular study derives from that agency. The College budget, a part of the international NATO budget, is provided from NATO funds through the Budget Committee of the NATO Council. Personnel, both in the student body and for the staff and faculty, are provided by the national governments.

The command and instructional functions are headed by the Commandant of the College, a Vice-Amiral d'Escadre of the French Navy, who will remain in that position for 2 years. Thereafter the position of the Commandant will rotate to Great Britain and then to the United

States. There are four Deputies who together with the Commandant and his Chef de Cabinet form a Council of Studies. The Deputy for the Army is a brigadier general of the United States Army, the Deputy for the Navy a commodore of the Royal Navy, Great Britain, the Deputy for Air, a brigadier general of the Air Force of France, and the Deputy for Civil Affairs, a foreign service officer of the United States Department of State. The instructors are allocated on the basis of one to each six members. There are 10 instructors: 9 are of colonel or equivalent rank of the Army, Navy, and Air Forces of France, Great Britain, and the United States, and one is a financial expert and official of the Bank of France.

Fifty-six members are authorized. They are allocated on a proportional basis: Great Britain, France, Italy, and the United States are allocated seven spaces each, Canada is allocated five spaces, Belgium, Denmark, Greece, Holland, Norway, Portugal, and Turkey each are allocated three spaces, and Luxembourg and Iceland are allocated one each.

The members of the first course are lieutenant colonel and colonel in rank for the army and air forces, and commander and captain for the naval forces; all but one of the civilians are members of the diplomatic services or Foreign Offices of their respective countries and of a rank and responsibility within their services comparable to the military officers. The other civilian is a senior civil servant of his country's Ministry of Defense. It is contemplated that each class will have 9 or 10 civilians, but there is no hard-and-fast rule and it is quite possible that there may be in the future a larger proportion of civilians than presently planned. It is desirable that the military members have previous service in national joint staffs or have graduated from national joint schools. This College assumes the members are capable staff officers and does not undertake to give them a course in staff work or in organization and operations of staffs. It also assumes that the military members are familiar with armed services other than their own.

The first course had 47 members from 10 nations. Luxembourg and Iceland felt that they could not provide members for the initial course. The students were in general well grounded in their own arms of service and had some knowledge, although it varied widely among the individuals, of the other services and of joint staff work. Many of the members, both military and civilian, had held responsible positions in departments dealing with NATO matters in their own countries. A number of the military officers had served within their Departments of Defense, or had held responsible command positions. Several are slated for promotion and for important positions within

their own national governments upon completion of the course. Others have been assigned to duties in the subordinate commands and in SHAPE as well as to the NATO Council and other agencies of the NATO.

The instruction at the College corresponds to the National War College and the Imperial Defence College. The course of study is limited to 6 months. Every effort is made to have two complete courses within each calendar year. The course consists of scheduled lectures, the solution of problems, and instructional trips. Lectures are scheduled for 5 days a week, Monday through Friday, and are generally 50 minutes in length, followed by a question period of from 45 minutes to an hour. For the rest of each morning, the student body is divided into four discussion groups composed of from 10 to 15 members each and a member of the faculty who acts as a discussion group leader. These discussion groups cover the lecture and any collateral points that may be pertinent to those raised during the formal talk. The discussion groups are kept as informal as possible and it has been found to be a most valuable means of instruction.

The basic structure of the class is the committee composed of five or six members. There are nine committees in the College. Each committee has a member of the faculty as its advisor. He sees to the distribution of the problem, answers questions, and makes sure that the necessary information is available to the committee in the solution of their problems. These are generally solved in 3 weeks.

Committee membership consists of officers of the Army, Navy, Air Force, and a civilian, each member on any one committee being of a different nationality. A chairman is appointed by the faculty from membership of the committee. With each new problem the chairman is rotated and the committees are redivided in order that each member of the College can have the experience of being a chairman, and also to allow every member to serve with as many of his classmates as is possible in the 6 months' period. A secretary is selected by the members of each committee, and this position is also rotated.

The College is bilingual, French and English, and every committee report is prepared in both languages. At the conclusion of a problem one or more solutions are presented in the lecture room to the entire student body. At the conclusion of the formal presentation there is a discussion and criticism by the members on the solutions, and a summary by the faculty of the major points raised in the solution or in the discussions.

A simultaneous translation system is operated in the lecture room. No translation system is operated in the committees nor are translators or interpreters furnished, all the members being expected to

overcome the barrier of language by their own ingenuity and linguistic ability. So far they have been successful, although language difficulties continue to be a very real obstacle to the full expression and comprehension of ideas.

On 16 May 1952 the first course graduated 45 members from the College. Seventeen members were assigned to NATO organizations, 13 members returned to their own national agencies on duties directly connected with NATO, and 15 members returned to normal national duties or were unassigned at the time this article was written. As yet the College is too young to have experience factors to apply in judging members' performance after they have graduated. The major effort has been to acquaint the members with each other, to present to them NATO-wide problems on both national and international levels, to furnish them with experience in working together in international committees where they must learn the art of compromise, overcome the language barrier, and acquire a realization and understanding of national viewpoints and national problems as they affect the international organization. In addition the military members are made aware of the importance which economic and political factors have on military organization, operations, and planning; and the civilians learn the realities of military power and its application.

Allowing for the normal attrition among the graduates, it is felt that the next 5 years will see formed a cadre of about 400 active officers, military and civilian, with a broad basic knowledge of international problems. Their entire attention has been focused for a half year on the NATO problems. The existence of such a group cannot but produce a revolution in modern coalitions, and further insure the success of our great experiment in an international defense community.

NATO Defense College

MDAP AIR DEPOT

UNTIL recent years the Air Force was mainly concerned with strategic, tactical, and troop carrier operations which could be determined entirely within USAF capabilities. But the framework and planning of yesteryear have undergone strenuous revamping since the establishment and development of NATO. Under this treaty the United States, and the Air Force as the delivering agency, committed itself to furnish aircraft and associated equipment to our allies in Europe and to teach personnel of these countries how to operate this equipment. As a result, a survey was made in August 1950, wherein it was decided to establish an air depot in Europe capable of handling supplies and giving technical advice on maintenance problems to the

NATO countries under the Mutual Defense Assistance Program. It was also to be responsible for indoctrinating logistics personnel of the European MDAP countries in our methods of stock control and maintenance procedures, with the ultimate aim of making them self-reliant in these functions.

At that time no central organization had been established on the Continent for controlling these procedures, although the Air Matériel Command had a well-established organization in the United States for supervision of the program. Considering the large amounts of money that were going into the program, it was evident that a special organization would be needed overseas for logistical control.

In the fall of 1950, the search began for a site for such a control point in Europe. Certain factors entered into long-range planning before final selection of a site for the depot could be made. First, when aircraft were delivered to France, Belgium, the Netherlands, Denmark, Norway, Portugal, or Italy, it was evident that their Air Force supply and maintenance systems were not always properly set up to handle these aircraft. Technical advice would have to be furnished so that they could make the best use of the supplies which the United States would furnish under the program. Technical service of this nature would require a central European location on which to base field service teams.

Second, up to this time Erding Air Depot, in Germany, was handling all supplies for USAF aircraft on the Continent. With the build-up of USAF units in France, Erding would not be able to carry the full load and supply all needed stocks. Strategic considerations as well dictated that another depot, further removed from the "front line" of Germany, be established.

Third, Burtonwood was handling supplies for those USAF aircraft located in England as well as being responsible for distribution of aircraft supplies for MDAP.

Finally, no firm policy or procedure had been established for either property or dollar accounting of MDAP supplies. It was evident that a specialized organization was needed to handle both MDAP and USAF participation in the program.

Much searching was involved in finding a location which could satisfy the greatest part of the requirements for such a depot, especially warehousing space and additional land for construction of more warehouses. The site finally chosen was at Chateauroux, France, where two airbases were located in close proximity to each other and to the town itself. One of the airfields, La Martinerie, had been used by the French Air Force, while the other, Deols, was used by the Société Nationale de Construction Aéronautique de Sud-Ouest

(SNCASO), a government-subsidized aircraft plant which had been manufacturing and repairing French naval aircraft. On 27 February 1951, the United States signed a basic agreement with the French, under which the Air Force would rent both bases.

To all intents and purposes the depot was activated in the middle of July 1951, with the arrival of the first detachment of the 73d Air Depot Wing, although the 7300th Matériel Control Group, composed of both supply and maintenance experts who would work with the MDAP countries, had been arriving in increments since early May. The depot was placed under the command of Lieutenant General Norstad, United States Air Forces in Europe, with headquarters at Wiesbaden, Germany.

The two bases, Deols and La Martinerie, comprise two points of a triangle, the city of Chateauroux being the third. Deols, which is scheduled to handle the maintenance portion of the mission, is located 3 miles north of the city, while La Martinerie, the supply base, is 4 miles northeast of the city and 5 miles from Deols. The city of Chateauroux itself is situated in the very center of France, making supply lines to almost any corner of France equidistant from the depot. The port cities of Bordeaux and La Rochelle, chief unloading ports for shipments from the United States, are also approximately the same distance from the depot.

La Martinerie had a sod landing field, a number of large hangars, some completely enclosed, others open at both ends, and a living area including barracks and hospital. All the buildings had suffered badly at the hands of the Germans, who had occupied them during the war, and the shortage of funds within the French Air Force had prevented much rehabilitation. Construction of additional warehouses, administrative buildings, a service club, additional barracks, a communications building, and new mess halls is scheduled to begin shortly.

Deols, which had been the manufacturing and overhaul center, was comprised of a factory of approximately 350,000 square feet, an administration building, a hangar, and several other buildings. At the present time, work is progressing on an 8,500-foot concrete runway at Deols to replace the sod field formerly used by aircraft from the factory. The construction work is being done by French contract labor and is scheduled for completion by the fall of 1952. This new airstrip will be capable of handling any type aircraft from jet fighters B-36's.

Although the location at Chateauroux is ideal logistically, the limited facilities and lack of funds to construct additional facilities present problems which must still be overcome. By April 1952, nearly

a year after the first contingent of personnel for the depot arrived, the only construction funds allocated to the installation were for the building of the runway. All other funds were for rehabilitation and maintenance only.

Meanwhile, supplies have been arriving at Chateauroux in an ever-increasing stream, so that all existing space has been filled to overflowing with both MDAP and USAF equipment. Many supplies have had to be stored, temporarily at least, on hardstands and covered with tarpaulins.

Housing, both for troops and dependents, has been another critical problem during the development of the depot. Some housing was available in barracks formerly occupied by the French Air Force personnel at La Martinerie, although these quarters needed rehabilitation. These buildings now house about 50 percent of the airmen. Dependent housing within the close environs of Chateauroux is practically nonexistent. The city was faced with an acute housing shortage even before arrival of USAF personnel, and the problem is even more acute now. Married personnel have been forced to go as far as 65 to 70 miles to find quarters for their families, and even then much of the housing is submarginal.

As was earlier indicated, the mission of the depot falls into two distinct phases—MDAP (NATO) and USAF. Under the MDAP phase, the depot is responsible for giving technical advice and assistance to both Title I and Title II countries receiving MDAP aid in maintenance and supply.

Survey teams of maintenance and supply experts from the 7300th Matériel Control Group have made extensive field trips to all countries in the program, giving assistance and advice. In many instances these teams have come up against organizational characteristics of the NATO countries which differ widely from those set up by the USAF. Our technical experts have had to introduce planning factors which would give these countries a realistic method for determining their requirements, both in supply and maintenance. Merely to indicate to them that we base a portion of our planning factors on personnel, organization, space, and equipment is not enough. We too must be realistic and understand the varying staff systems which in many cases are completely unrelated to ours. For example, in one country Air Force matériel is completely controlled by the Army, whereas another country must deal directly through the Ministry for Air. While these differences would not be particularly important if only one air force were involved, they are extremely important when an over-all logistical procedure must be applied to fit the needs of all.

The depot will also issue aircraft supplies to the MDAP countries as

needed to maintain the aircraft of each country. To monitor this task, a Statistical Control unit has been set up at the depot. It will keep an accurate record of expenditures for each country to insure that they do not overdraw their dollar account with the United States as established in the limitations set by Congress.

In brief, the MDAP system works as follows:

Each participating country estimates its long-term requirements, which are forwarded to the Military Advisory Assistance Group (MAAG) stationed at the American Embassy within the country. There they are scrutinized for accuracy and degree of urgency, and then forwarded to the Joint Military Advisory Assistance Group (JMAAG) headquarters in London for approval. If approved they are then sent to Air Matériel Command in Dayton, Ohio, for conversion into dollar amounts, which must be approved by Congress. Major items such as aircraft are shipped directly to the countries, while spares are allocated and sent to Chateauroux for distribution as needed. Under the USAF portion of the mission, the depot will supply and furnish depot maintenance for USAFE aircraft stationed in France. When the depot swings into full operation, this will include major overhaul of aircraft, engines, and all components.

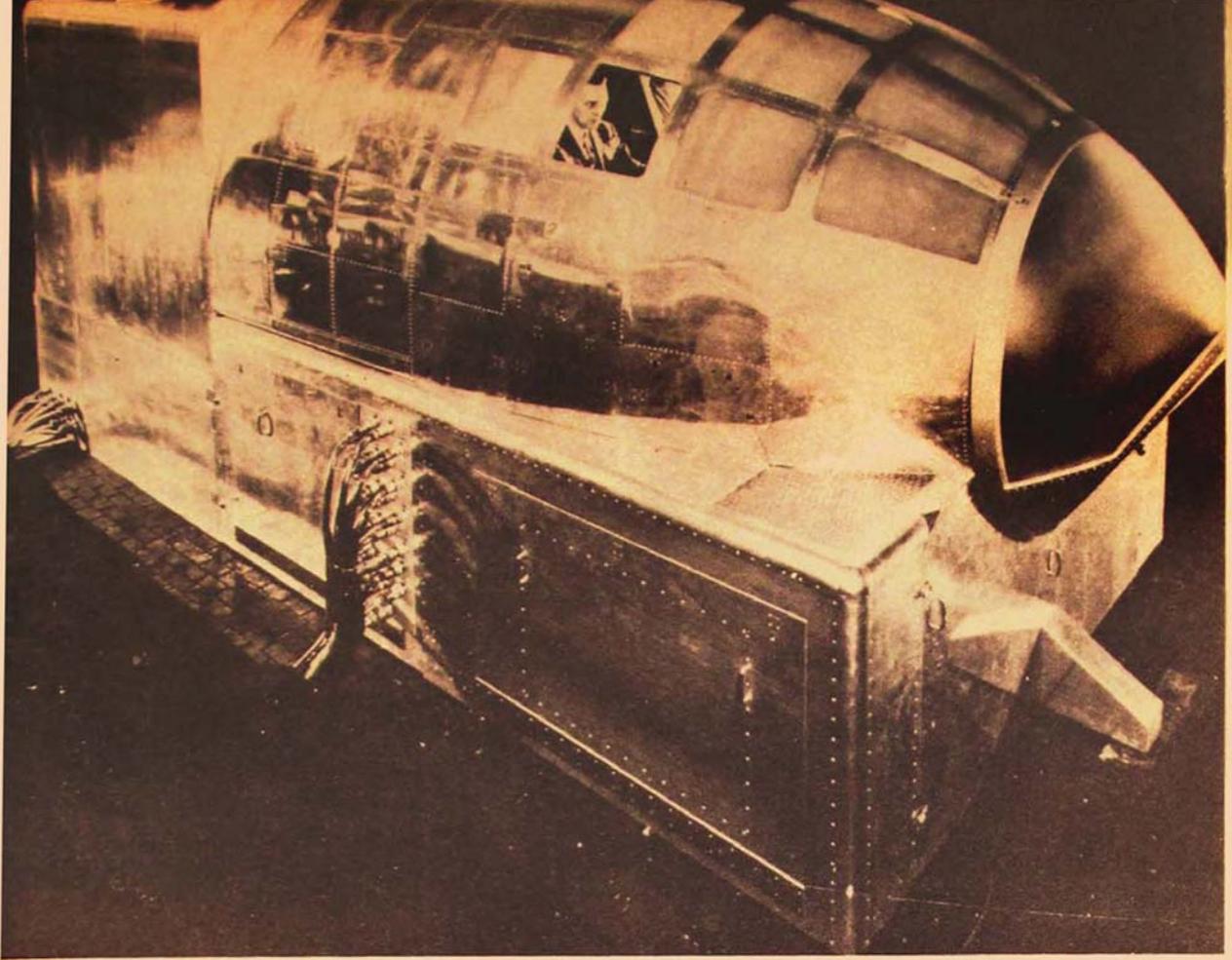
Supply for USAFE will consist of not only aircraft spares but all logistical supplies, including vehicles, furniture, and the thousands of items needed to maintain a present-day air force. It is estimated that within a short time, the Chateauroux Air Depot will be handling all Air Force property classes.

To further assist in this program, the Chateauroux Air Depot has already been forced to expand with the opening of two subdepots, located at Moulins and Bordeaux, France. The Moulins Depot is responsible for vehicle maintenance and supply, while the Bordeaux organization is a holding and shipping point.

The depot has solved one big problem for the NATO countries: for the first time there is one organization on the continent which will handle all supplies for aircraft furnished by the United States to the NATO countries, providing one central point where aircraft parts can be obtained with a minimum loss of time. Too, with dollar credit balances constantly at hand, the countries involved can find out in a hurry just how they stand financially in relation to the supplies that are needed.

Build-up of the Chateauroux Air Depot is a big step in the right direction, inasmuch as here are gathered the best skills and technical know-how of the USAF, made readily available to NATO to bring the Allied Air Forces, Central Europe, to the peak in efficiency.

73d Air Depot Wing, Chateauroux Depot

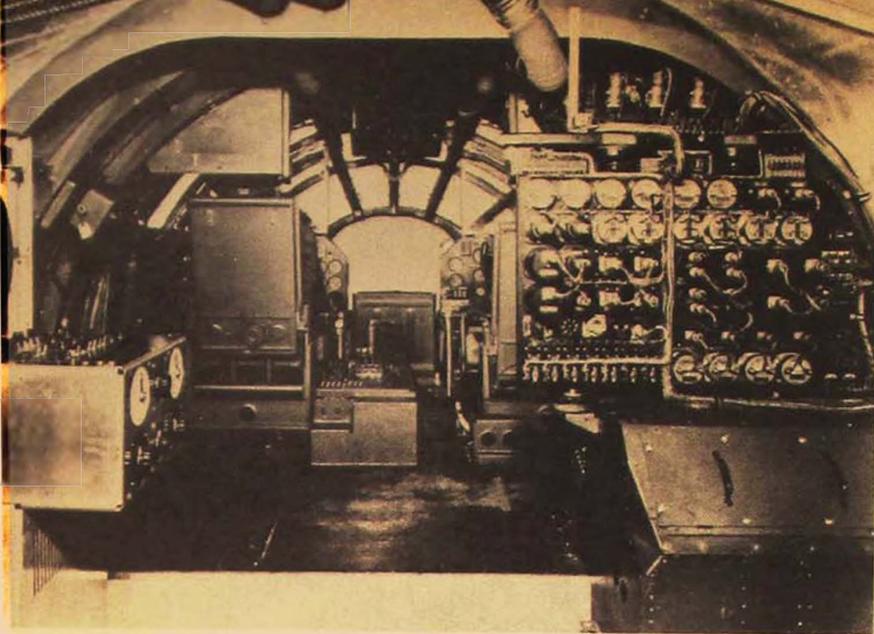


More than 228,000 parts, 95,000 feet of wire, and 382 unit assemblies which require 4,000 drawings for fabrication have gone into this B-50D flight simulator. Engines, wings, control surfaces, and gear are replaced by electronic computers which actuate cockpit instruments and pressurize the controls in response to the actions of the student or the instructor. Since accidents normally result from no one single factor but a combination of factors, simulators are far superior to aircraft as training devices. They permit combinations of troubles in engines, propellers, airfoils, instruments, electronic systems, radio, and accessories—combinations impossible to practice safely in actual flight. Realism is simulated by engine and cockpit sounds, airflow hiss, tire squeal on landings, propeller reverse, and brake action.

Flight Simulators

High-speed fighters and complicated bombers or transports pay rich dividends for skilled handling, but they are less forgiving of mistakes than the slower World War II aircraft. Aircraft and training costs have mounted so high that World War II rates of attrition in training can no longer be afforded. Since aircraft have doubled their speed and carry several times the poundage of built-in instrumentation that they had in World War II, it has been obvious that a radically new training device would be necessary to perform cheaply the job of making the pilot's reactions instinctive even under such intensified conditions.

The engineers had provided a partial answer in the instrument trainer, an electronic device which familiarized trainees with the new controls, gauges, and problems of jet aircraft. It was redesigned to duplicate exactly the cockpit of a particular aircraft. Every control, gauge, indicator, and lever was exactly where it would be found in the airplane. The only change from



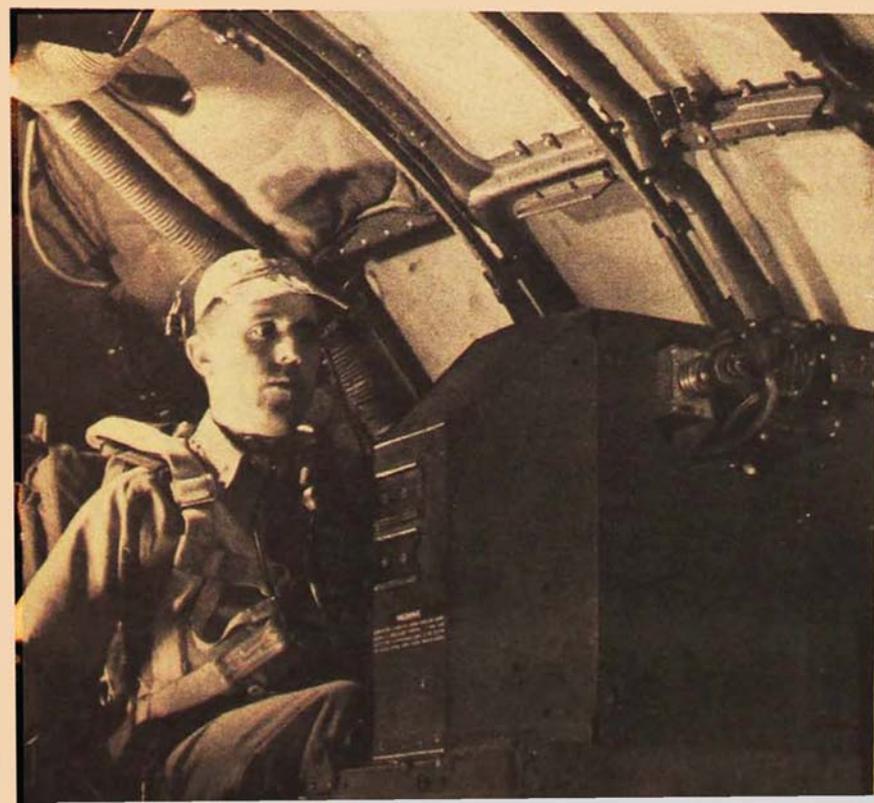
This interior view of the B-50D simulator shows the exact duplication of the cockpit. Pilot and co-pilot stations are located at the far end to the right and left of the center corridor. The flight engineer is stationed on the opposite side of the instrument panel. Located in the rear of the simulator at the "trouble console," the instructor can introduce approximately 85 different kinds of unusual conditions, including instrument

and engine failures, fires, wing icing, propeller and carburetor troubles, control locking, and radio disabling. Since over 80 per cent of all simulated troubles are related to the engines, the flight engineer gets extensive training. He is able to analyze engine problems, since their symptoms are reflected in his instrument readings.

the real cockpit was the frosted glass in the windows. Next flight characteristics were added. The result, as embodied in the B-50D simulator and simulators received or under construction for the F-86D, F-89C, B-47B, B-36D, C-124A, and C-97A, furnishes synthetic flight from cockpit check-out, through ground run-up and cross-country flight under total instrument conditions, to a "blind" landing. All instruments and mechanisms respond to the pilot's

Tensely watching his instruments, this pilot flies his B-50 simulator on final approach. Simulators provide both transition and proficiency training. In the former the pilot and crew receive realistic practice in operating a new or different type aircraft—practice which pays dividends in flight safety. Proficiency training

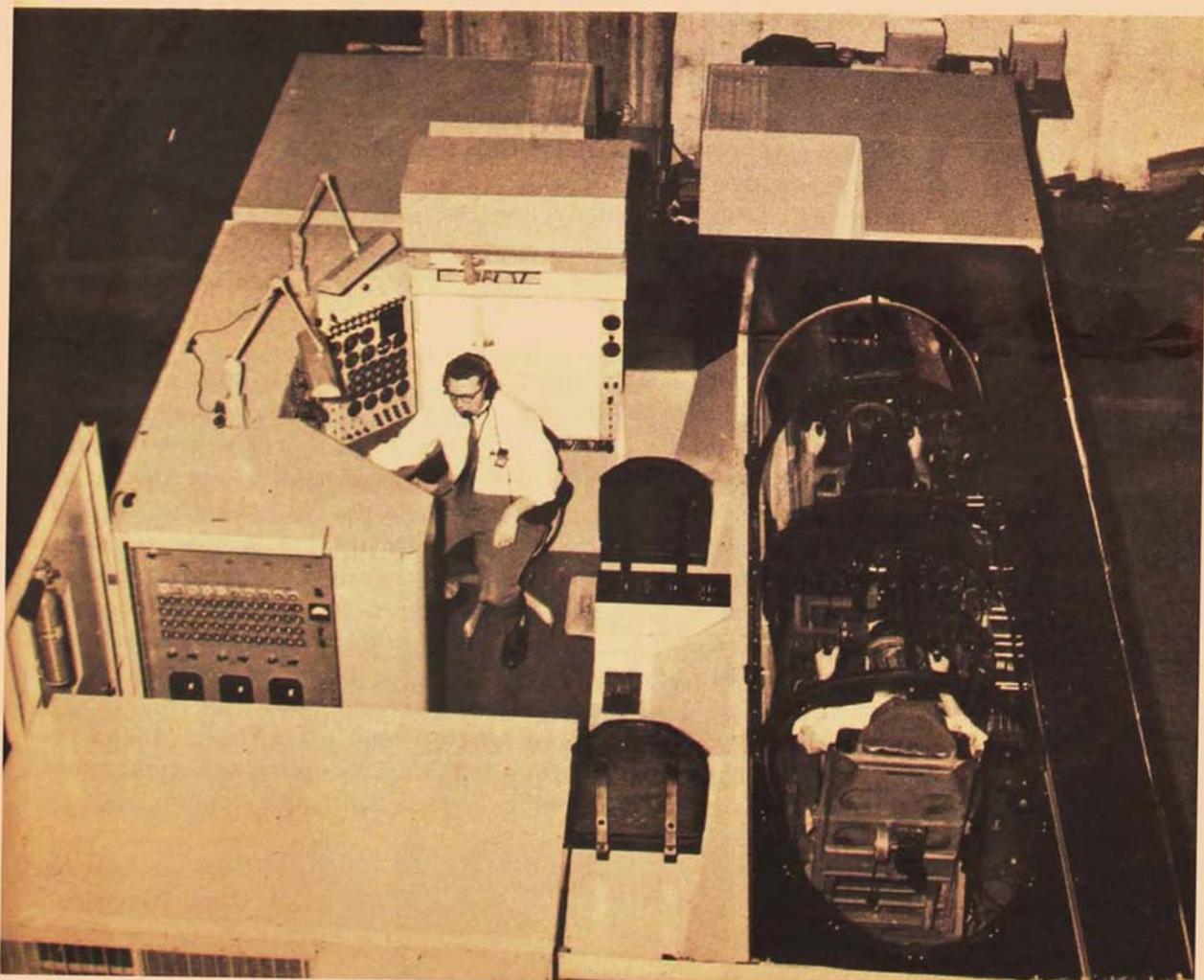
comprises routine check-out of personnel and practice in nonusual and emergency procedures. This phase yields about 85 per cent of the simulator's potential saving. A prominent airline estimates operating cost for a four-engine simulator on a 3,000-hour-per-year schedule to be \$20 an hour, as contrasted to \$400-\$500 per hour for similar training in the aircraft. Pan American Airways reports that 12.6 hours were formerly required to check out a pilot on Constellation aircraft, while only 4.02 hours are needed for pilots with simulator experience.



touch exactly as the airplane would respond in actual flight, complete with engine noises and vibrations.

The flight crew's handling of the equipment registers on a control board situated outside the cockpit. By manipulating the dials on the control board, the instructor can introduce a wide variety of circumstances such as engine failure, fuel system failure, hydraulic system failure, high engine temperature, and icing conditions, which might be encountered under actual flight conditions. This makes possible evaluation and comparative estimates of the skill of flight crews. The instructor can cut off the engines, simulate damage to the plane, or duplicate flight in extreme turbulence. If the crew fails to employ proper corrective measures, the emergency condition will be aggravated and could lead to a simulated crash.

The B-47B simulator incorporates all the typical high-speed jet flight features. The two observation seats in the center are used by the flight instructor, who has a full complement of instruments and duplicate controls. On his left is a flight recorder which continually plots the ground position of the aircraft during simulated flights and can be reset to allow flights of unlimited distance. On his right two recorders provide range, azimuth, and altitude information for ILS and controlled approaches and let-downs. Of special significance is the accurate simulation of fuel consumption and changing center of gravity. Both systems are controlled by the instructor. Engine starting sequence, take-off (normal and assisted), landing (drag-chute effect), in-flight maneuvers (in-flight refueling, stalls accompanied by buffeting, etc.), altitudes, air speeds, control pressures, and noises confront the crewmen with amazing similarity to actual flight. Some 65 different flight hazards can be duplicated when the complicated control board is operated by skillful hands.



Many variable factors determine the characteristics of flight in a given aircraft—aircraft configuration, power setting, airspeed, altitude, outside air temperature, variation in center of gravity with respect to cargo and gasoline loading, aircraft gross weight, and attitude of the aircraft with respect to its line of flight and with respect to the earth. Each factor and its effect on all other factors are continuously evaluated by a series of analogue computers which relate the flight characteristics of the simulator to the static and dynamic data obtained from the aircraft manufacturer. Each factor's interactions on other factors are expressed by mathematical equations which the computers solve. The changes are transmitted to the appropriate instruments or control surfaces.

The greatest value of the flight simulator lies in the saving in lives and money which it affords. A recent Air Force study of the training records of 2,929 pilots showed that of 672 pilots with below-average flight training records, 36 were involved in fatal accidents. Of the 2,257 pilots who had average or better-than-average flight training records, only 17 were involved in fatal accidents. This is no chance variation. Better training means fewer accidents. And the simulator offers more hours of more diversified training in a shorter space of time than would be possible in the air, with a realism which was never approached by more primitive trainers.

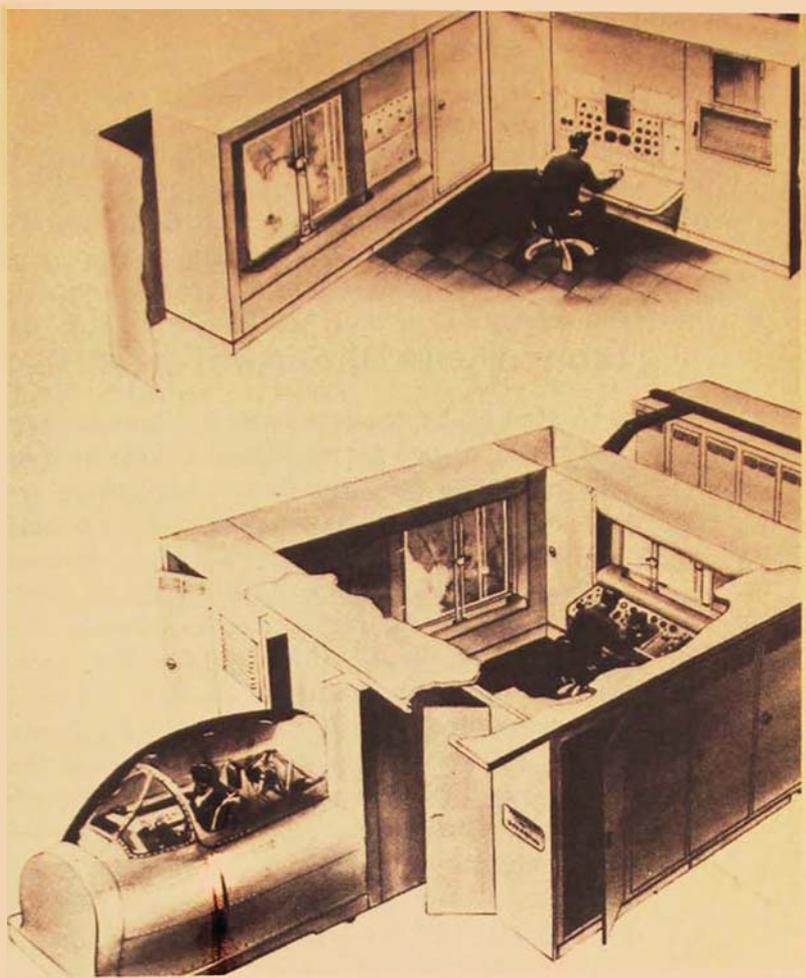
A simulator costs far less to build than its parent airplane. If one simulated crash saves one actual airplane, the simulator has more than paid for itself. For example, simulators cost from \$200,000 to \$700,000 each while an airplane may vary in cost from half a million to several million dollars. The larger and more complex the aircraft, the greater is the saving per simulator.

Transition training alone would be sufficient to justify the initial cost. Not dependent on the weather, the machine can operate 18 hours a day every day of the week. Air Force statistics for the first 3 months the B-50D simulator was in use showed operating costs of the training device to be \$68 per hour, including depreciation, maintenance, personnel, replacement parts, and electrical power, but excluding real estate. Similar cost of operating one B-50 aircraft was calculated to be \$423 per hour.

Crews who take a course on the simulator are trained, coordinated, and familiar with the equipment when transition training is initiated on the aircraft itself. This lessens danger to the aircraft from crew mistakes. One B-50 crew, flying at 18,000 feet under icing conditions with turbosurge on two engines, reported they would have lost control of the aircraft except for the simulator training which had prepared them for this very situation. Another crew, in an identical emergency, reported that simulator training was responsible for safe completion of the flight.

Greatest of all the savings and the most immeasurable in dollars is the more thorough training made possible by the simulators. Not only does the increased crew efficiency make loss of life and property less likely but it raises the proportion of successful missions. Constant repetition, constant surveillance of the instruments, repeated handling of the controls during simulated normal flight, and repeated experience with emergency conditions provide the best known method of developing efficient crewmen. Because the cockpit duplicates the cockpit of the particular airplane, the training is as realistic as it would be in the airplane itself. Crewmen also can log as much air time in a simulator in a week as they could in the airplane in a month. In an airplane, only one flight a day might be feasible, but in the simulator, crewmen can go through starting procedures, take-off, flying, and landing time after time. A day or two of this type of training should familiarize the pilot, copilot, and flight engineer with all phases of normal flight and make their motions automatic.

The F-86D simulator is the first all-weather jet fighter simulator delivered to the Air Force. Duplicating every conceivable flight condition, it is also the first simulator to combine the simulation of two aircraft, the F-86D and an approaching enemy aircraft which the pilot is required to attack. This simulator requires two instructors, one for flight performance (shown at top of photo) and the other for radar operations and control of the simulated enemy aircraft or target (shown at bottom). Weighing 35,000 pounds, the simulator contains over 100,000 parts, including 1,152 electronic tubes and more than 60 miles of wire.



Flight safety experts stress the importance of prompt emergency action. The first 10 seconds, they believe, usually determine whether a plane survives or crashes. If a crewman has been drilled to recognize and analyze a trouble symptom as soon as it develops and if he takes action to correct the condition within the first 10 seconds, he has the best chance of survival. But if he has to experiment, the condition may be too far developed by the time he discovers its cause. To make reactions in emergencies automatic, the instructor introduces various hazards into simulator flights. These might be engine failures, turbulence, fires, fuel-line failures, hot tail pipes, or a combination of any of them. All would be reflected on the instruments of the simulator just as they would be in the airplane. In actual flight the instructor would have to straighten out the trouble—if he could—in order to save lives and property damage. But in a simulator the trouble can continue to its logical conclusion. Crew members have to work out the problem themselves. If they fail and the “plane” crashes, no one is hurt. The conditions are repeated and the crew try again until they find themselves reacting automatically to any situation. This training would be impossible in an airplane. Some conditions a pilot or flight engineer might encounter only once in a lifetime of flying. By experiencing them time and again in a simulator, he is ready for them.

Simulators, the Air Force has found, provide training with realism, safety, economy, thoroughness, and rapidity. [Hq. Air Matériel Command.]

. . . Air Force Review

Economy in the Air Force

For the past two years there has been a crescendo of demands for greater economy in the armed forces. A multitude of charges of misuse of money, matériel, and manpower has been flung at the three services. Many of the charges have been exaggerated or have resulted from misinformation; others have been pertinent and accurate. The services have never contended that a certain amount of waste and extravagance did not exist in their operations, nor that their procedures could not be revised in the interest of efficiency. They have pointed out that many of the specific instances discovered were natural, if regrettable, by-products of hasty expansion, of hurried rescheduling of production and procurement schedules, of facilities which were inadequate for sudden influxes of manpower. The point they were making was in the nature of explanation rather than excuse, but it has not stilled criticism. Indeed doubt has arisen in some quarters that the services are capable of cleaning their own houses. It has been said that there exists in what is loosely termed the "military mind" such a cavalier attitude toward the public purse that the military are incapable of becoming economy minded.

Although such charges have arisen in every period of large-scale military expansion in our history, the peculiar circumstances of today's situation make economy and efficiency of operation more vital than ever before. For one thing, we must supply half the world with weapons of defense. The cost of these weapons has gone up tremendously since the Second World War. And we must arm against a threat of uncertain proportions, sustain our defensive readiness for an indefinite number of years, while at the same time providing for a high level of civilian production and exercising great care not to wreck our national financial structure by inflationary spending.

As the most costly member of the military establishment—spending 24 cents out of every American tax dollar—the Air Force has been subjected to considerable criticism for waste and inefficiency. As a young service, born in an era of scientific management procedures, the Air Force has always taken advantage of the latest business methods and is proud of its economical management. Its first Secretary, Stuart Symington, had been a business leader and applied modern business methods in setting up the management system. The first military comptroller system, inaugurated by the Air Force in 1946, supervises all Air Force fiscal matters, and has introduced a cost accounting system. The Air Force procurement system, largest in the world, was created by the former president of Sears Roebuck, Arthur Barrow.

Since 1949 a part of the effectiveness rating for every officer has been his record on the economical use of resources. Both in-service schools and selected universities offer courses to Air Force officers in advanced management. The Incentive Award System has effected large savings throughout the Air Force by providing a cash incentive to civilian workers who suggest economies and time-savers in their work. A similar system of awards has been urged for airmen and junior officers.

The Air Force has always been economy conscious and freely admits there is

still room for improvement. In response to recent criticism, therefore, the Air Force has launched a series of intensified programs to make every officer and airman aware of the cost value of the operations for which he is responsible or in which he works. In addition Headquarters USAF and the headquarters of all major air commands are studying command and organizational structures, tables of organization and allowances, etc., in an effort to consolidate and modernize the Air Force establishment. A criterion has been set in working toward the goal of a 143-group Air Force. This 50 per cent expansion in combat strength must be achieved with only a 13 per cent increase in military personnel and a 30 per cent increase in civilian strength, or a total increase in strength of approximately 20 per cent. To gain an idea of the Air Force answer to this challenge, let us examine the program for economy in the Air Force as a whole, and then take the specific programs formulated by a major command in each of the three basic categories of Air Force activity—primary mission, support, and indirect support.

There is no one over-all integrated Air Force economy program operating under centralized direction, nor is such a program contemplated. Not only would it require additional manpower to set up such a staff agency, but its responsibility would cut across numerous areas already being efficiently handled by other staff agencies and commands. Instead the approach has been one of intensive indoctrination of all Air Force personnel in the necessity for economizing. All the normal public relations channels, both external and internal, have been used extensively to point out the importance of the program. Conferences have been held at all levels to instruct commanders and supervisors of specific ways in which they can economize in their organization. It has been stressed that while large Air Force units must save where they can on their budgets, supplies, and manpower, it is equally important that the innumerable small leaks be plugged in the lower echelons.

Perhaps the largest single economy which the Air Force could make has already been made on the policy level. Faced with the tremendous cost of modern airpower and with the vital urgency of building up an Air Force capable of absorbing and retaliating against any surprise air attack by an enemy, the Air Staff took a calculated gamble. They reasoned that while the air war might not be won in the first month or two of total war, it could certainly be lost within that time. The goal of the build-up of the Air Force was set at 126 first-line groups and 17 troop carrier groups with little provision for reserves normally considered essential for sustained combat operations. The decision represents a saving of billions of dollars and hundreds of thousands of men.

The bulk of the intensified economy program in the Air Force is being handled through the Management Improvement Program. As formalized by Air Force Regulation 150-7, dated 1 February 1952, management is defined in its broadest interpretation and is considered to be synonymous with command. Although the policy and program will be originated and monitored by the Director of Manpower and Organization, under the Deputy Chief of Staff, Operations, Headquarters USAF, actual implementation will be the responsibility of the command line.

The primary objective of the Management Improvement Program is to achieve maximum operational efficiency through the best possible use of resources. Modern management practices and procedures will be applied at every echelon of command, in every work situation, to guarantee that funds, matériel, manpower, space, and time are being used most efficiently. This will entail a constant reference of programs to the primary mission, of objectives to the program, and of individual jobs to the objective, so that there will be a proper balance of resources

between the primary mission and direct and indirect support functions, and between manpower and other resources. Work assigned to an individual must be commensurate with ability and position, and must be regulated under the most effective supervisor-worker ratio. The program is intended to point out "soft" areas where improvement is needed and to provide remedial measures. Through incentive awards and other techniques it is to encourage the widest participation in management improvement. And finally, it will provide a system of reporting which will reveal to all echelons of command what improvements have been made or are projected, so that these improvements may be quickly disseminated throughout the Air Force.

At the Air Force level, the Air Force Management Committee, composed of representatives from the Deputy Chiefs of Staff of Comptroller, Development, Matériel, Operations, and Personnel, and the Air Adjutant General, the Inspector General, and the Surgeon General, meet periodically to discuss the management programs, study the problems involved, and analyze progress. In addition all major commands and other commands reporting directly to Headquarters USAF have been ordered to install management improvement programs within each command.

The tools which the Management Improvement Program employs are divided roughly into two categories—those used in spotting managerial weaknesses and inefficiencies, and those used in correcting and monitoring them in the future. Means of analysis are furnished by surveys of management practices and procedures, of manpower and equipment utilization, of organization, of methods, and of layout; by work measurement studies, by cost analysis; by program analysis; and by recurring and special investigations. Once deficiencies have been located, recommendations are drawn up for necessary changes. Such recommendations may include the establishment of required controls and better standards, the standardization of the best practices and procedures, work simplification, the reduction of effort in the least productive activities, and the elimination of nonessentials. Corollary to any improvements is the necessity for direct, positive executive action based on sound decisions, continuing indoctrination of commanders and supervisors at all levels in the principles of good management, and the widest possible participation in the Incentives Award Program.

A further program for commanders has been suggested by the Chief of Staff: a critical analysis and reduction in size of headquarters staffs, elimination of duplicated positions at many echelons of command, elimination of specialized officer positions where functions can be performed as additional duty, and a re-examination of regulations for restrictive, redundant, or obsolete administrative practices.

When any one of these programs can effect a saving throughout the structure of the Air Force, the saving is considerable even though the change itself be small. For example, if one-half of one per cent of the personnel currently in direct or indirect support functions throughout the Air Force could be shifted to the primary mission, this would mean a saving of 6,000 manpower spaces, representing approximately 24 million salary dollars. Or to take an example already in effect, about 2 years ago Air Matériel Command decided it was feasible to do limited jet engine top overhaul—engine check and replacement of worn parts but short of complete disassembly—in air base shops. With a modest investment in tools, engines serviced at an operating base could be kept in service more hours, and the expensive process of shipping engines to an air depot was eliminated except when an infrequent complete overhaul was needed. A year

later a joint Headquarters-USAF-Air Matériel Command study found this new program had considerably lengthened the time between complete overhauls and offered a significant reduction in the requirement for spare engines. Other streamlining actions included a reduction in pipeline time by aggressive police action of transportation delays, improved shop mechanization and organization to speed up overhaul time, halving authorized depot and air base stock levels, accelerating those improvements in engine structure which resulted in longer engine life, intensifying runway clean-up to keep bolts, nuts, and small scrap from being sucked into jet engines, and improvement of pilot and crew operating techniques. As a result of these programs, a \$700,000,000 reduction in spare engine procurement was effected in fiscal year 1951. The program reached full effectiveness in fiscal year 1952, saving \$800,000,000. This 2-year total saving of \$1.5 billion eliminated the need for a supplemental budget in fiscal year 1952. The continuing reduction is reflected in the lower estimate for spare engine procurement in the 1953 budget. Other important savings are not reflected in these figures. An engine factory which the Air Force planned to construct and equip at a cost of \$140,000,000 was canceled and its production program consolidated with that in an existing plant at a net saving of approximately \$65,000,000. Also not included as savings is the cost of the materials involved, the saving of scarce metals, and the reduced demand on the nation's skilled manpower pool.

Let us examine two of the systems used by the Management Improvement Program to determine the efficiency of an Air Force organization. The system of Cost Control has been in effect since 1947, operating under the Comptroller's office. It makes the military manager aware of the total cost in dollars of all his unit activities, a figure which previously, because of central procurement of most supplies and centralized pay disbursement, had not been available to him. Under this system all equipment and supply items and all personnel expenses are charged to a functional area, such as a motor pool, a base hospital, food service, supply control, or supply warehousing. By comparing these figures for a number of Air Force bases, a cost standard is developed for each of these functional areas. This furnishes the manager with a realistic dollar yardstick by which to measure the dollar efficiency of his unit. With this system the cost per person of base maintenance and supply functions has been reduced by 3 per cent—and this in a year when civilian pay was increased 10 per cent. Beginning with fiscal year 1952, a modification of cost reporting is being tried in the Appropriations and Expense Accounting System. Designed to tie the cost system into the budget so that a more realistic budget can be prepared and justified, its chief new features include division of funds into locally funded and nonlocally funded categories, and it costs military personnel according to the functions at which they work rather than to the one function to which they were—often only nominally—assigned. It is, in short, a closer approach to an actual accounting system than was the previous expense-reporting system.

A cross check on production efficiency is afforded the military manager by the Work Measurement System. This system sets an incentive standard for a given work program on the basis of average Air Force production in that kind of work with a certain number of personnel. This standard applied on a program level—roughly equivalent to a squadron—breaks down into functions and further subdivides into activities, and activities into operations. Consider Air Installations as a program, for example. Its functions would include Maintenance and Repair, Fire Protection, and Sanitation. Under Maintenance and

Repair activities include Electric Shop, Field Lighting, Painting, Carpenter Shop, Air Conditioning and Refrigeration, and Plumbing. The Electric Shop has such operations as Motor Servicing, Motor Rewinding, Interior Wiring, Exterior Wiring, and Underground Wiring. Each supervisor reports on the total number of man-hours available each day in his activity, the number of each kind of work unit produced and the time taken for each unit, and the number of man-hours used in unmeasured work—jobs which are out of the assigned province of the activity. This intensive reporting usually lasts only 2 weeks. An average or tentative standard is then derived from the peak workload and the middle rate. This becomes the incentive standard, against which the future work of the activity will be measured. Further reporting includes only a monthly accounting of total man-hours available and number of work units produced. The various activity reports are summarized monthly in squadron headquarters. In this way the effectiveness rate can be watched from month to month. This system not only enables supervisors and commanders all along the line to see factual evidence of the efficiency of their sections, but it eliminates the former time lag when a recommendation for change had to go to the top and come back down before something could be done about it. Now the remarks are studied at each level as the report goes forward, and action is taken at the appropriate level. At higher levels these reports will be processed through statistical services of the Tables of Distribution Mechanization Program.

The Work Measurement System plans ultimately to align itself with the cost accounting system so that the same account groupings, as applied to tables of organization and distribution, are used in both systems. When this has been done, the Air Force can take a statement of workload, compute manpower requirements, figure its cost, and arrive at a performance budget of the type used in many major American industries. Another advantage of the Work Measurement System is that with this sound yardstick derived from field experience, sound tables of distribution can be drawn up. These in turn become the basis of sound planning tables. Electric computers can be used for the preparation of programs and budget, reducing to a matter of days the time required to prepare these documents.

Although the Management Improvement Program has yet to be developed to its full size and effectiveness, its future usefulness is indicated by the fiscal year 1951 saving of an estimated \$27,380,000 through management improvement.

As a part of the general review of equipment tables, the Survey Panel of the Air Force Equipment Review Board completed an extensive survey of tactical combat units in the Far East Air Force in June 1951. The Panel reduced or deleted 2,200 combat equipment items and substituted 700 which cost less but actually increased the capability of tactical units. The 1,500 deleted items ranged from hand wrenches to rock crushers and represent a net saving of approximately \$94,000,000.

Corollary Air Force economy programs are in reality intensifications of the normal activities of various staff agencies. Since 1948 the Comptroller has introduced selective auditing, world-wide statistical reporting, revision of the military pay system, simplification of the budget structure, an integrated accounting system, and a guide to management analysis. Within its own activities, the Comptroller has effected such economies as the \$3,000,000 saved in cash discounts in 1951 through the prompt payment of commercial bills. Improved procedures and management techniques in the Air Force Finance Center, Denver, Colo., have reduced manpower requirements by 300 spaces.

Also indispensable to good management in the Air Force is the Inspector



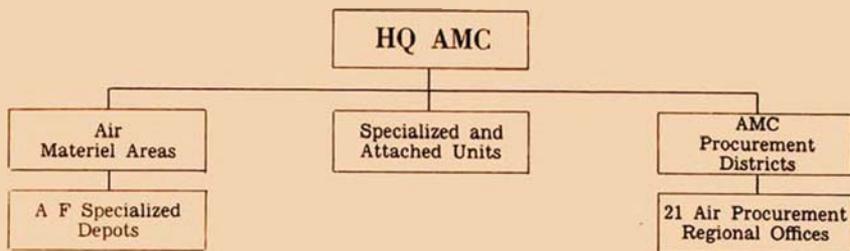
Proof that the Air Force economy drive is world-wide is found in FEAMCOM's massive "Operation Roll-up," an extensive billion-dollar program to reclaim damaged World War II equipment from all over the Pacific theater. Aircraft parts are recovered from all areas and shipped to Japan, where FEAMCOM, as shown above, inspects, sorts, and repairs or salvages them. The reclaimed parts, treated and packed to prevent corrosion, are stored for future supply requirements in Korea.

General. Operating at all levels of command, inspection teams spot weaknesses and waste and fix responsibility for correction of deficiencies. The Surgeon General is currently engaged in an intensive survey aimed at reducing administrative routine for Air Force doctors, providing more compact organizational structures, and improving the efficiency of air evacuation.

Through all current and proposed programs, the Air Force is tightening its organization, improving its procedures and techniques, and eliminating guesswork and approximations from planning, budgeting, and management of personnel and matériel. Even more promising are the successes achieved by individual commands and the individual response to the Employee Suggestion Program, which in the first half of fiscal year 1953 will save the Air Force an estimated \$2,313,784.

The major commands are an important link in the chain of command which puts teeth into the Air Force economy program. Much of the planning, contracting, and monitoring of the program is done at this level. From here must come the steady pressure and emphasis necessary to achieve and maintain personnel vigilance and the technical information and perspective needed at the lower operating levels.

Air Matériel Command

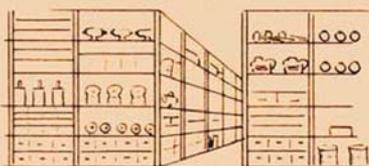


mission

Air Matériel Command must purchase all Air Force equipment and supplies, must maintain depots which distribute these supplies, and must furnish overhaul maintenance on aircraft equipment.

how big is it?

\$16 billion
budget



200,000 item inventory



1949 aircraft
27,919 a/c engines
1,511,518 component parts

Because AMC has grown up in constant contact with modern big business and because many of the leaders who developed the Air Force logistical system were themselves businessmen, AMC has always been efficiency and economy conscious. Early in 1949 a broad management engineering program was inaugurated in the supply division to standardize organization, evaluate operations, and streamline administrative functions. Thanks largely to this head start, the Korean war and the build-up of the Air Force to 90 groups found AMC functioning at a new high in efficiency. In the 12 months ending 30 November 1951, the supply division processed 34,849,197 line items as against 27,674,516 in the same period in 1950—a 25.9 per cent increase. Tonnage handled in the same period increased 46.3 per cent, from 3,647,334 tons to 5,337,662. The division now handles 0.084 tons of supplies per man-hour, compared with 0.074 before the Korean war. These figures are especially significant because they largely represent finished products, indicating that the other phases of AMC were keeping up with the accelerated pace.

Other improvements attributable to management engineering include the use of modern assembly line principles and work simplification. In the Wilkins Air Force Specialized Depot at Shelby, Ohio, a system of conveyors and a pneumatic tube system have reduced the cycle of processing shipments and receipts from a week to 24 hours. With the conveyor, the depot shipped 60,000 uniforms—27 carloads—in 2 days; without it, the job would have taken a week. With the conveyor, the depot shipped 55,000 line items in 28,000 man-hours. Without it, only 38,000 line items had been shipped in 52,000 man-hours. A detailed analysis of local purchases within AMC supply depots suggested a series of work simplifications which save 47,000 man-hours—the equivalent of \$75,000—each year.

Reclamation is playing an increasingly important part in cutting the costs of supply. Approximately 1,000,000 gallons of used aircraft engine oil were re-refined and re-used in fiscal year 1951, at a saving of \$196,800 over the cost of the same amount of new oil and with no loss in lubricating quality. The pro-

gram is now being expanded to include re-refining of oil used in ground equipment. Some 151,400 square yards of nylon were recovered from unserviceable personnel parachutes, reducing the Air Force's nylon bill by about \$77,000. Some of the fabric is used to make scarves, bags for silica gel, and pressing cloths. More than 50,000 over-age personnel parachutes are being converted into small cargo parachutes. New cargo parachutes would cost \$62.96 each, but conversion cost is only \$10 each, an eventual saving of \$2,600,000 when the program is completed. Another 1,000 over-age parachutes are used each month in Air Force survival training. Silver is being salvaged from condemned water desalting kits. Thus, five old kits pay for one new one, with a total saving to date of \$33,600. The scrap-metal drive has been intensified within the Air Force in the last year. In October 1951, the Air Force scrap sales in the Zone of Interior alone totaled 2,446 short tons and netted the Air Force \$122,454. Of the annual USAF requirement of 6,000,000 pounds of silica gel, an anticorrosive used in packaging to protect supplies from tropic, arctic, or marine exposure, AMC now reactivates about 3,900,000 pounds, saving 45 per cent of normal purchase price, or \$698,000 per year. In addition more than 1,000,000 pounds of scarce sulphuric acid, an important component in silica gel manufacture, are saved by the reduction in the number of pounds of new silica gel which must be produced. And the same silica gel can be reclaimed as many as nine times.

Another large money-and-time saver in AMC is the Production and Resources Division, which works with industry to solve Air Force production problems. In 1951 this division dispensed critically needed machine tools and production equipment to industries working on defense contracts. These tools, drawn from government stocks stored since the Second World War, would cost \$2,000,000,000 to replace at present prices. Not only was this a tremendous saving in money, but in time. When the Spencer Lycoming Co., a subsidiary of the AFCO Corp., expanded its plant facilities to handle more airplane engine production, it was able to draw on the Air Force's machine tool reserve and go into production in 9 months instead of the 5 years it would have taken to get all new tools. When the Pryor Manufacturing Co., of Mansfield, Ohio, was awarded a subcontract to produce airplane wheels and brakes for the B-47, Air Force reserve tools enabled the company to deliver the first wheel only 6 months and 7 days after the contract was let. The Production and Resources Division also monitored a program through which worn-out or outmoded Air Force welding machines were rebuilt. On the 295 rebuilt welding machines the Air Force saved \$1,310,896 over the cost of new machines. Worn parts discarded during rebuilding are salvaged for their metallic content.

Working closely with the aircraft industry, the division was able to cut the use of critical materials in jet engines by 70 per cent in fiscal year 1951. Another project resulted in the substitution of lighter weight magnesium for aluminum in howitzer drop platforms. Not only was a noncritical metal substituted for a critical one, but manufacturing man-hours were halved since magnesium could be cast rather than extruded.

Another big money-saver from this division was the Air Force Optical Tooling Program. In aiding the aircraft industry to introduce and develop optical techniques which improve the accuracy of tools, AMC has made aircraft production easier and more flexible, and has improved field servicing. The system meant a 25 to 30-per cent reduction in the time required for tooling and has reduced tool fabrication costs by as much as 40 per cent.

All of these programs and others, such as the suggestion and awards program—which saved an estimated \$3,838,500 in the calendar year 1951—and cost reduc-

tion programs at the various AMC installations, are in full effect. In recent months they have been augmented by AMC's Management Improvement-Cost Reduction Program, monitored by the command comptroller. Parts of this program have been in operation for some time and have already been discussed. It has two main purposes: (1) "to make constructive economy so instinctive with all civilian and military personnel at all working levels that savings in money, manpower, and matériel can be effected on a scale ensuring the delivery of 'More Air Force Per Dollar,'" and (2) "to provide every possible assistance to industry (Air Force contractors and subcontractors) in accomplishing the same end."

The fundamentals involved in an economy program were thoroughly examined by a planning committee at AMC headquarters. Among other things they found certain stumbling blocks to widespread improvement in economy. Poor communication results in the loss of intent and accuracy of directives as they filter down from the commanding general to the supervisor at unit and section levels. This loss occurs in the intermediate management levels, where directives frequently are not thoroughly circulated, are quietly ignored, or are misinterpreted. A proposal to remedy this situation in the case of the economy program requires the commander of each AMC installation to speak to his management personnel on this level on the importance and the personal application of the economy program. Another block is misemphasis in applying the economy program. For example there is the human tendency to present exaggerated, unrealistic dollar-and-cents savings purely for reporting purposes. Too much time is spent searching for economies to report rather than actually planning and effecting new economies. Traditions in procurement, supply, and maintenance are also a block. Too often these are uncritically accepted and defended. Techniques, methodology, and directives must be reviewed for obsolescence, and each worker must be encouraged to stand off and take a critical look at what he is doing and the way he is doing it. The problem of job protection frequently arises. An enterprising manager may reduce his requirements for manpower and other resources only to find that he has thereby downgraded his own position. The mere recognition of such obstacles by no means indicates that they are conquered, but it does mean that the program has been planned with a full awareness of them, and those which cannot be hurdled must be gone around.

Let us review some of the plans for the fiscal year 1953 program. Last year the management engineering subdivision embarked on a massive command-wide management audit. All command personnel were requested to report on their jobs, giving a breakdown, usually over the period of a week, of time spent in performing various tasks. Although the reports were burdensome to the personnel and almost overwhelmed the analysis staff at headquarters, the scope of the program has given both headquarters and field commanders a more complete picture of job requirements in their respective commands. The program for fiscal year 1953 will decentralize the supervision of the management improvement program. Commanders are being asked to initiate their own projects in areas where problems in effective use of resources or a lag in production is apparent.

All this is in keeping with the idea that once intermediate management has been alerted to the necessity for good management and cost-consciousness, the best results will come from the people on the spot.

This same philosophy is behind the large-scale decentralization of the procurement and reporting sections of AMC headquarters. By the end of 1952 some 2,000 headquarters personnel will have been moved to AMC field installations at the rate of 250 per week. It is expected that their presence at the point of purchase

or shipment of supply stocks will remedy many of the discrepancies in reporting stock levels, in relieving shortages, and in processing Unsatisfactory Reports. Although the cash value of this decentralization move will be difficult to pin down, improvements in accuracy of reporting, in equalization of supply levels, in speeding up procurement, as well as reducing such overhead expenses as travel time, should be of solid value to the Air Force.

A phase of the program which is assuming more and more importance is the work with civilian contractors and subcontractors to encourage them to make the most effective use of their resources and to reduce construction costs on Air Force materiel. This is in no sense a program of compulsion, but rather of mutual striving toward the joint goal of "More Air Force Per Dollar." And it is likely that as time goes on the companies most effective in pushing better management and cost reduction will find they can submit lower bids to the Air Force, and this in turn might possibly mean more contracts for the firm. Already AMC has evaluated some 32 reports on the results of the campaign within the aircraft industry. These reports are sent back to the companies with AMC suggestions and comments. At the same time the companies are encouraged to recommend improvements in AMC's procurement methods. Anything which will produce a better product in a shorter length of time and at a lower cost is the concern of this program.

The Air Materiel Command Management-Improvement Cost-Reduction Program is designed as a long-range proposition. It realizes that the crux of the program is how completely the middle and lower echelons of AMC personnel accept and support the principles of better management and cost reduction. To be truly effective, these principles must become a part of the individual thinking habit and must always combat the tendency to do things the old way simply because it is traditional. Moreover, AMC is aware that industry itself will play a vital role in achieving "More Air Force Per Dollar."

Air Training Command



mission

Air Training Command must train all incoming Air Force personnel, operate flying training from basic flight training until the crews are combat ready, and must provide technical training.

how big is it?



300,000 personnel of which 150,000 are in training pipeline



200 courses



42 air bases
9 civilian flying schools



training-aircraft range from T-6 to B-47

Just as procurement, supply, and maintenance are the major activities of the Air Matériel Command, so the training of Air Force personnel from the time they enter the Air Force until they are assigned to their first permanent station, or, in the case of air crews, until they are pronounced combat-ready, is the concern of the Air Training Command (ATRC).

In initiating an economy program which will take into account the special problems of the command, ATRC has established Management-Improvement Committees at command headquarters and at the headquarters of each of its three air forces. These committees represent all major staff agencies, and supervise the five general areas into which the command Management-Improvement Program is divided: (1) projects for improvement in selected management improvement problem areas; (2) management engineering service; (3) training in management fundamentals and mechanics; (4) recognition of and awards to persons responsible for outstanding improvements in management mechanics; (5) command-wide dissemination of information about improvements developed at one installation which are of command or Air Force-wide value. Special problem-area projects can be represented by the Project New Look, which is studying means to improve food service. Its goal is to install better management practices rather than to solve all messing problems by constantly increasing the number of KP's. Results are already accruing, both in efficiency of operation and in improved quality of service.

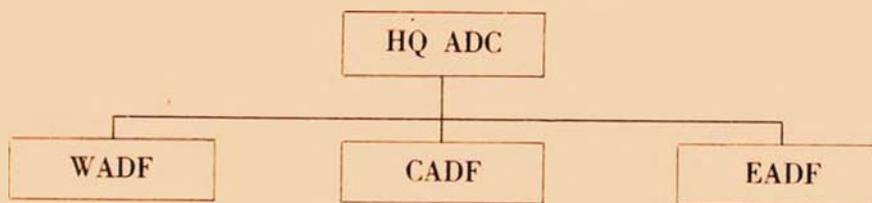
Management engineering is still limited in its operations because of the shortage of trained personnel, but already it has more than demonstrated its value. As a result of one management engineering study made at Ellington Air Force Base, the total number of authorized personnel in the 3606th Maintenance Squadron was reduced by 75 spaces. This decision was based on an analysis of the workload, and was done at a time when assigned aircraft, the number of which is also based on workload, were increased from 91 to 95. This reduction represents a saving of \$149,712 per year. Here, as elsewhere, the management engineers do not implement any changes. They merely act as staff consultants to the commander or supervisor of the function they are analysing, and present their recommendations to him. The experience of the present management engineering personnel will be made available to many management supervisors through the workshops which have been scheduled for this fall to give management supervisors first-hand knowledge of management engineering techniques. The command has recommended to Headquarters USAF that a school for management supervisors be established. Another series of workshops in management instruction has been conducted this summer at Lackland AFB. These three workshops have trained a total of 75 management instructors, and their job will be to teach modern management practices to middle-bracket supervisors at air base level, thus supplementing the USAF senior-bracket Manpower Management Course offered at George Washington University. It is hoped that this instruction on the air-base level will greatly broaden the participation in the economy program and will augment the stream of small economies such as the ones reported last year by the Flying Training Air Force, when 7 air bases reported 29 adopted changes in such diversified activities as personnel, training, distribution, maintenance, facilities, and administrative services, reflecting a total saving of \$279,361 per year.

With selection, training, and use of personnel the main concerns of ATRC, two other phases of their economy program show how the command is working on its own unique problem. Conservation of military manpower, an important phase of the Air Force economy program, is being explored in the Lackland Feasibility

Test. This is an experiment to determine the extent to which WAF and civilians can replace male AF personnel on ZI bases so that these men can be reassigned. The test is working well and may be extended to other bases. The use of civilian contract schools for instruction in basic flying is an example of the same conservation of military manpower. And the improved stanine tests now given to applicants for flying training, which are expected to reduce the pilot-training elimination rate from 43 per cent to 29 per cent, should result in a large saving in administrative effort and manpower.

The most recent phase of the ATRC program is perhaps the most unique. Feeling that any economy program is effective only in proportion to how many people actually participate in it, ATRC began on 1 July an intensive, command-wide publicity campaign with the announced goal of making every person in the command economy and cost conscious. The campaign uses the most modern commercial advertising techniques in an effort to impress not only permanent party personnel but the thousands of airmen and cadets in the training pipeline, so that they will carry cost-consciousness with them when they go out to other commands. The visual trade-mark of the campaign is a perky Scotch relative of the ATRC symbol, "Torchy." He utters slogans on economy from colored posters on all squadron bulletin boards, from placards above light switches and water faucets, from tags on the end of electric light pull-cords, from desk nameplates, and from a round stamp placed on all correspondence within the command. He is quoted on billboards placed on ATRC flight lines and on singing "commercials" broadcast over base radio stations and public address systems. Cadet marching songs have been fitted out with verses urging economy. Most of this massive publicity campaign has been prepared with surplus or scrap materials and with volunteer labor, so that the total cost of the program has been negligible. The program must of course be continued for some time, both because of the nature of its "selling" job and because of the constant large turn-over within the student personnel. But this very turn-over means that within a relatively short time a significant percentage of the personnel within the Air Force will have been exposed to this intensive indoctrination on the necessity for economy in the Air Force.

Air Defense Command



mission

Air Defense Command must detect, identify, intercept, and destroy hostile aircraft near or within our borders; provide the air warning system; and support the Civil Ground Observer Corps.

how big is it?



11 air divisions



hundreds of aircraft control and warning stations



20,000 Ground Observer Corps observation posts

The youngest of the three major "fighting" commands in the Air Force, born of an aerial threat to our homeland which has only become of first importance in the last 5 years, ADC has from its inception been accustomed to austerity. Faced with its tremendous responsibility of protecting most of the North American continent from air attack, it has had to stretch its manpower, money, and matériel to the utmost. Consequently, economy has from the beginning been a part of its organization and operation, and as the command gains experience it continues to shuffle its resources to provide more effective defense. The most single important economy effected in ADC has been an outgrowth of this principle. Because of the critical importance of scrambling all available interceptors as soon as possible after an alert has been sounded, only one or two fighter-interceptor squadrons can be based on one airfield. A study revealed that the establishment of an air base wing headquarters to support and administer this size organization constituted needless overhead. So the number of air-base wings has been reduced from 13 to 8. Not only has this consolidation eliminated hundreds of officer and airman spaces, with a saving estimated at over \$1,000,000 per year, but the elimination of one intermediate headquarters between the group and division level has increased the efficiency and capability of ADC. The 31st Air Division has recently completed a test in which all subordinate units reported directly to division headquarters. Although many disadvantages were noted, the results have been favorable. A modification of this organizational system may produce a helpful reorientation of manpower in ADC.

A more recent move to tie the Management Improvement program to the primary mission of the command has come with the establishment of the Combat Readiness Report. This report computes the kill effectiveness of ADC, which is considered the desired end product of the command just as profits are the desired end product of a civilian corporation. On the basis of this report, ADC headquarters determines what can be done to raise this effectiveness. If the units available to ADC in a certain area are operating at maximum efficiency with the equipment they have, the command then has the choice of spending its money for more aircraft, more Aircraft Control and Warning equipment, etc., or, if necessary, of stripping the defenses in a less important area to bolster those around critical targets. With the Combat Readiness Report as a basis for proper distribution of funds between the primary mission and the support functions, ADC headquarters, like the directors of a corporation, can work back along the chain and find the weak spots. This is where kill effectiveness relates to management improvement, for it is on these weak areas that the management experts must go to work and strengthen the weak link in the chain. Rather than producing random efficiencies and economies, the program will help where help is most vital to the command's primary mission.

One point of attack of Management Improvement in the last year has been an attempt to curtail or eliminate less essential functions. As a result of this analysis, some 30 medical spaces will be eliminated from staffs at Air Defense Force level, at a savings of \$120,000 a year. Other studies to curtail or eliminate certain activities include: Air Inspection, Ground Safety, Flying Safety, Special Services, Personal Affairs, Information and Education, Historical Services, Air Police, and Motor Vehicle Utilization. One announced target area for the new fiscal year is excess property.

In any combat command, much of the dollar savings must come from improvements in maintenance procedures, and these account for much of the \$4,500,000 saving which ADC reported last year. Dollars saved in maintenance are doubly important because they usually come from increased efficiency and the

saving of man-hours. At McGuire AFB, for example, there was difficulty in changing the high-pressure tires on F-94 and T-33 aircraft. With a manually operated tire-changer it took three airmen 15 man-hours to change a tire. The operation cost \$12.75 and after three changes the wheel became so damaged that it required overhauling. A hydraulic tire-changer was manufactured in the base shops for a cost of \$63.75. Using it, two airmen can change a tire in 1 hour, at a cost of \$0.85. This represents a saving of \$8,568 per year on that one air base. The new tire-changer can be used on any type aircraft and does not weaken the tire walls or damage the wheels. At McChord AFB simplified maintenance procedures on repairable electronic equipment reduced the number of steps in the repair process from 45 to 23. This simplification made supervision more easy, substantially reduced the paper work, and saved time in repairing items, thereby furnishing prompter service and reducing the number of items in the pipeline. Thanks to an employee suggestion, \$37,080 a year has been saved through the use of an improved after-burner adapter jig for jet aircraft maintenance. Another employee developed an improved weather canopy for the F-94 which protects the valuable electronic equipment and yet can be speedily removed when an alert is sounded. These are but a few samples of the variety of maintenance improvements which show the interest of the personnel in ADC in greater efficiency and economy.

This survey has only sketched the broadest outline of the efforts being made throughout the Air Force and within three representative commands to strip fat and waste from the operations of the USAF. Every Air Force command has an economy program. Each is geared to the mission of that command and each has special projects in management improvement and cost consciousness. This interest is not new in the Air Force, but efforts have been intensified. It is not an effort of commanders alone, but is receiving increasing support from all personnel. It is by no means completed, but it will continue to grow.

Books and Ideas . . .

Early Pacific Air War

DR. ROBERT F. FUTRELL

IN December 1941 and the early months of 1942 the United States Far East Air Force was driven from the Philippines and Java back to the northern shores of Australia where at last it could withstand the everywhere-victorious Japanese. Its story was one of defeat, confusion, frustration, and disaster. Lacking the time to prepare, these few men had to fight with too few modern weapons, and their best efforts met inevitable failure. Yet no shame attaches to these men in their defeat, for the dishonor belongs instead to the whole American people, whose complaisance denied the wherewithal required to defend national honor and possessions in the Far East. The men who fought the Japanese in the Philippines and Java sacrificed themselves to buy time which their country required to rearm, and in the end the United States gained victory. This story is one of courage and determination in defeat, but its real lesson is for the future: if the American people again let down their guard they may find it already too late to insure their national survival. In an atomic age victory and survival alike will go to that nation which is ever ready for the attack of an aggressor.

In his introduction Gen. George C. Kenney rightly calls this book* "a superbly written story of a shoestring war in all its grim and heartbreaking aspects." Already one of the foremost historical novelists of our time, Mr. Edmonds has combined his great talents as a storyteller with the careful research of a historian to produce a brilliant recording of the heroism of these first months of AAF operations in the southwest Pacific. In subsequent air campaigns of World War II where massed attacks diminished the personal role of any one man, defying personalized description, one tends to forget that the individual man was always the key to American success. This has not been the case in Mr. Edmond's book; his story is told in terms of the individual participant's thoughts, actions, and what often was, in effect, each man's private war against the Japanese invader. The author has leaned heavily upon personal interviews and written statements of participants in the events, and their personal, group, and squadron diaries and histories have supplied the other material from which the book was written. Thus the story is essentially that of the men, and in a way they are the authors.

If there are historical faults in this story, they derive from the fallible memories of the participants which contributed so much of the source material utilized both in the preparation of this volume and for the official AAF history of the Philippines campaigns. Very few written contemporary documents escaped destruction during the confusion incident to unit movements. Where the memories of participants differ, it is unfortunately probable that the real truth may never be known. One of the most important items of such controversy concerns the handling of the FEAF bomber force during the early morning hours of 8 Decem-

**They Fought With What They Had*, by Walter D. Edmonds (Boston: Little, Brown and Company, 1951, \$5.00), pp. 532.

ber 1941. The author records the assertion by Gen. Lewis H. Brereton, then commander of the Far East Air Force, that he sought and was denied permission to get off an early morning B-17 attack from Clark Field against Formosan targets; he also presents the statements of General MacArthur and his chief of staff, Gen. Richard K. Sutherland, that Brereton made no such request. Mr. Edmonds also notices the typescript "General Brereton's Headquarters diary 8 Dec. 41—24 Feb 42" which found its way from India into the USAF Historical Archives at the end of World War II, but he is unable to accept the diary as "wholly reliable" because he is "fairly sure that it has been reedited" (p. 92). This dismissal of what may well be the most important surviving document closely contemporary to the times cannot be lightly disregarded. It is believed that more intensive analysis of this manuscript will establish its complete authenticity and thereby lend important support to General Brereton's narrative.

With the single exception of the author's lack of decision concerning the events of 8 December 1941, the book is soundly documented history which, to the delight of a reader, possesses all of the action and interest of the best of Mr. Edmond's historical novels.

USAF Historical Division

Saudi Arabia in Transition

ALONZO POND

DURING World War II, Americans and the Air Force were obliged to operate in all parts of the world. Detailed knowledge of every world area was essential. In spite of our government's ability to call in "experts", the kinds of information and area studies necessary to our operations simply were not available. Unlike the Russians, we had not considered the details in the lives of other people and other countries important enough for comprehensive study.

Even in peacetime, our knowledge of other nations is far from satisfactory for our needs. Competent knowledge of particular areas of the world and its people is becoming more and more essential to the conduct of world affairs.

This is particularly true of Arabia and the Near East—a strategic area from almost any point of view. Geographically it lies between the western democracies and the rising, struggling, groping eastern countries. It is on the middle corridor to the Communist world. Its strategic shadow falls athwart the Suez Canal which connects the sea lanes of East and West. That route is still a logistically important lane even in this early morn of the Air Age. The Arabian Peninsula also sits on top of the world's biggest oil pool. It is the largest known power supply for the mechanical and industrial world's economy.

In the world struggle for men's minds, in the war between free men who believe in the dignity of the individual and those who deny that belief, the people and the government of Saudi Arabia are strategically important. In this region men have done as their fathers did for a thousand years. They have not been disturbed by the ideas or mechanical improvements of the western world until recent years. Today Saudi Arabia has a government which recognizes the value of its oil power but also recognizes the dignity of the individual. It is a strong government, able to keep the peace within its borders, able to encourage modernization and increased well-being without too swiftly discarding the values of its past. It appears to be a government which recognizes the size of its task at

home. It devotes its energies to that task rather than trying to take an active part in the affairs of its neighbors. Therein lies its strategic importance for long-range planning in the Near East. If the progress and development in Saudi Arabia continues along present lines the well-being of its rugged, individualistic people will increase. Such an example of improvement will do more to turn the Battle for Mens' Minds in favor of western democracies than all the propaganda either side can offer. Nothing so thrills a man as the knowledge that his own efforts are rewarded. That is why America has grown strong. It looks as if similar opportunities are becoming available to individuals in Saudi Arabia.

If we are to have the cooperation of this awakening part of the world in peace, or in war with a common foe, we must know the country. We must understand what motivates the people and their leaders.

*Arabian Highlands** is a very detailed account of exploration in the southwestern half of Saudi Arabia. The author, H. St. J. B. Philby, covered the area on foot, by camel and donkey back, and occasionally by motor car. He walked to the boundary markers along the Yemen-Saudi Arabia frontier. He mapped 239 boundary pillars from sea level to 8,150 feet above the sea, from the shores of the Red Sea to the edge of the Empty Quarter desert region. He describes the wells, the mountain peaks, the valleys, the river beds, and the people who inhabit them. The clothes they wear, the food they eat, the frequency of their prayers, and sometimes even the geneologies of the ruling families are all recounted in detail. The manuscript waited long for a publisher because 700 pages of geographical details are more than best-seller readers will buy. Fortunately for those of us who need those details, the Middle East Institute of Washington, D. C., recognized the merits of Philby's record.

The author points out that:

The fauna and flora of this area are as varied as its climate and scenery, while man himself ranges from the negroid types of the coastal plain to the pure Semitic Arab of the highlands and the desert. Man, too, is more numerous in this region than in other parts of Arabia, as he has been since the earliest times, when the perfumes of Araby pervaded the markets of the world and won for this southern corner of the desert peninsula the pleasant sobriquet of Arabia Felix.

Things have changed since those days, as any reader of these pages will discover for himself. But things may change again. Arabia has slept all too long and soundly, but there are signs of her awakening as the dawn of a new era breaks upon her from the west. Who can predict what the day may have in store for her? Or what gifts she may yet have to confer upon humanity in the place of her forgotten spices? This work can at least claim to show her as she is at the moment of her transition from decadence to renaissance.

Arabia may be great again as she was in the heyday of Sheba during Solomon's time. That day may not be too far distant for two important reasons. First, the Saudi government is an enlightened government which rules according to principles of right and wrong stated in the Koran and accepted as truth by the people. The government believes in maintaining internal peace. It grants equal justice in the courts for individuals. It fosters improvement in their well-being and adopts modern, western ideas only as rapidly as Saudi citizens can assimilate such changes and improvements. Practical common sense is allowed to enter into the solution of administrative problems and the settlement of disputes with

**Arabian Highlands*, by H. St. J. B. Philby (Ithaca: Cornell University Press for the Middle East Institute, 1952, \$8.50), pp. 771. The two journeys recorded in this volume by Philby were made in 1932 and 1936-37, although not published until 1952. This essay will in part fill in the gap between Philby's work and the present as well as help to bring the reader up to date on Saudi Arabia.

Yemen and in disagreements on currency changes between the central government and the merchants of outlying districts.

In some instances the actual border between Saudi Arabia and Yemen, as agreed on by the boundary commission, was adjusted to include villages on one side or the other while all or parts of the fields belonging to them were across the line. By mutual agreement taxes are collected from the villages regardless of which country legally controls the fields. When the Saudi government attempted to substitute the Arabian Riyal for the Maria Theresa Riyal of 1786, which had been legal tender and the standard coin for over a hundred years, the merchants in southern Arabia objected. The merchants won their point and the government ceased its demand for exclusive recognition of the new coins and their inflated value.

Second, an enlightened group of American businessmen is *developing* the oil resources of the country. Note the word is *developing* and not *exploiting*. The oil development in Saudi Arabia is on a partnership basis between American business and the Saudi government.

Americans got the concession instead of other western nationals because Ibn Saud, after watching Americans for two years on the island of Bahrein in the Persian Gulf, concluded "you Americans are interested in digging oil. You are practical and efficient. You do not try to run the local government and you don't interfere in local religion. We can get along on such basis."

Saudi Arabia is an excellent example of how American business ideals—the ideals preached by Rotary Clubs, Kiwanis Clubs and all the other businessmen's organizations—actually can be practiced in a backward country.

Progress is made in Saudi Arabia by giving the people a *handup* instead of a *handout*. Intelligent and industrious Arabs are given opportunities to start their own businesses with capital borrowed at 6 per cent interest. That alone is a fantastic departure from the Near East custom, where usurious interest has been a millstone on the poor for generations. The native labor is trained and educated for better jobs and natives get those better jobs as fast as they are qualified. The dignity of the individual is respected. An educational program gives Arabs opportunities to study at colleges and universities in the Near East and in the United States. Government royalties from oil have paid for a 7-mile railroad dock out into the Persian Gulf and have built a 400-mile railroad across the desert to Riyadh. Schools and hospitals are being built throughout the country.

Buildings, of course, do not make institutions. It takes time to educate teachers and to train technicians who understand their work instead of merely going through routine motions. The progress of these programs, therefore, depends on how rapidly native personnel become interested in professional fields.

Water wells have been drilled in the desert to increase the well-being of the nomad tribes. More important than the wells themselves is the educational program which accompanies them. A motion picture has been produced which explains where the water comes from, what happens if too many wells are dug in any one region or if the well water is allowed to be wasted in useless run-off.

The Saudi government has allowed the oil companies to have a motion picture theater although many Moslems believe that pictures are forbidden by the Koran. A sign beside the theater ticket window informs all theater goers that Saudi Arabian law prohibits Moslem Arabs from attending pictures. The government, of course, does not insist that patrons of the movies give proof as to their religion. But neither does it flaunt the new entertainment in the face of those who are not ready to accept it. Whether an Arab attends the movie or

not thus becomes a matter for each individual to argue with his own conscience.

However, in the case of the educational film on the use of wells and conservation of groundwater the government frankly encourages its distribution throughout Saudi Arabia. The film is shown to the nomads who profit by the new wells. They are practicing the conservation of water which it teaches. Perhaps a logical man will say that the government follows an inconsistent policy on the subject of pictures. Be that as it may, the policy is one which is bringing a backward population into a modern world with fewer dislocations and less tragic reactions than the drastic methods of its neighbors.

The American business philosophy of giving a hand-up instead of a hand-out is beginning to spread in the Near East beyond the borders of Saudi Arabia. United States aviation companies have bought into local Near East organizations. Many of those were started by United States World War II pilots. These companies are now using Americans in the sales or promotion side of the business and training Arabs to replace them in other phases. These companies, like the oil companies, are bringing about important changes to life in the Near East. Arab teachers trained at the American University of Beirut, Lebanon, on the Mediterranean coast, now accept jobs over on the Persian Gulf 1,200 miles away. They can fly to their job in one day. They can come home for holidays. Without air transportation these Arabs could not be persuaded to leave home for such jobs.

College-trained Arabs now expect to find jobs in aviation, oil or pipeline companies. Before American business demonstrated that the dignity of the individual could be respected in business and that advancement depended upon individual ability, these college-trained people thought business beneath their dignity.

The changes are even extending into the countryside, where farmers are taught improved methods. For instance, a large American population in the oil fields demands quality fresh foods to which they are accustomed at home. The nearest farmers who can produce such foods are in Lebanon on the other side of the peninsula. Result: American firms are sending their own agricultural agents to these farmers. They teach the Arab farmer how to grow quality products, how to standardize packaging for air transportation and establish honest marketing procedures. These actual demonstrations are gradually convincing natives. It is this same process which has raised American quality and quantity production in the last half century. The changes in the Near East cannot be made overnight where customs and methods have stood for thousands of years. They must come slowly with patience and understanding of the Near East mind.

In Saudi Arabia at least there is a conscious effort to keep those true values and principles of life which are sound while adopting techniques and comforts of western civilization only as fast as the people can assimilate them.

Perhaps as Philby says, this is the dawn of a new era on the Arabian Peninsula.

Research Studies Institute

Man and Space

JOSEPH W. ANGELL

THE United States Air Force to date has found no substantial evidence that flying saucers and similar reported phenomena are other than products of optical illusion and over-heated imagination. The Air Force School of Aviation Medicine does, however, maintain a Department of Space Medicine.

For the past 3 years this department has, in the words of the Air Surgeon General, "been devoting its efforts to determining stratosphere." Since 1946 the press has reported with some regularity that the Air Force is at work on the development of an artificial earth satellite or "space station." And it is a certainty that since the end of World War II the Air Force, in common with the other military services, has devoted money, talent, and effort to surpassing the spectacular accomplishment achieved by the Germans with their war-time V-2—the first long-range supersonic rocket and the acknowledged prototype of a vehicle which some day may transport man beyond the stratosphere.

The quintet of books here noted * provides diversified, rewarding, and sometimes difficult reading on the history and present status of rocket flight, space medicine, and astronautics—the relatively new discipline defined by the dictionary as "the science which treats of the possibility of traveling through interplanetary space." To one who is willing to indulge in some of the more restrained scientific and quasi-scientific speculations on the possibilities—and presumed consequences—of flight into outer space, the first three titles listed offer spellbinding reading.

The Exploration of Space, by the Chairman of the British Inter-planetary Society, may be regarded as a preliminary guidebook to astronautics, prepared by an expert for amateurs. Employing a remarkably pleasing style (the book has been distributed in America by the Book-of-the-Month Club), Clarke conducts the tyro through the basic problems of interplanetary flight, assuming always that the means for overcoming the problems are now known and that only the application remains to be done. For those who will raise the burning question of whether such application will harm or benefit a race that seems unable to cope with its present purely terrestrial situation, Clarke gives some rather compelling answers, which, if accepted, are likely to reorient the moral and ethical thinking of the doubters and pessimists. Such matters remain, of course, pure speculation. But the fact that we are now at the point where such speculations are relevant can hardly be gainsaid.

Ley's compendium is virtually a small-scale encyclopedia of rocketry—past, present, and—within limits—future. More than two-thirds of the volume is devoted to the history of speculation, research, and accomplishment through the end of World War II. One chapter and a fragment of another recount what official sources have revealed of American rocket experimentation since 1945. The concluding three chapters (of 12) are given over to content that falls under the headings of "The Rocket into Cosmic Space," "The Spaceship," and "Terminal in Space." To a narrative that is always facile and sometimes glib, Ley adds two appendices. One is a detailed essay on "Rocket Airplanes and Rocket-assisted Take-off," the other an assemblage of mathematical and chemical tables, lists of rocket characteristics, and a bibliography which contains in addition English, German, French, Italian, Russian, Spanish, and Dutch publications. Ley was at one time a member of the prewar German *Verein für Raumschiffahrt*—The Spaceship Travel Club—and he is also the author of *Dragons in Amber*, and *The Lungfish, the Dodo, and the Unicorn*.

**The Exploration of Space*, by Arthur C. Clarke (New York: Harper, \$3.50), pp. 199.

Rockets, Missiles, and Space Travel, by Willey Ley (New York: Viking Press, \$5.95), pp. 436.

Space Medicine: The Human Factor in Flights Beyond the Earth, edited by John P. Marburger (Urbana, Illinois: University of Illinois Press, \$3 cloth; \$2 paper), pp. 83.

A Handbook of Space Flight, by Wayne Proell and Norman J. Bowman (New York: Perastadion Press, \$3.60), pp. 186.

200 Miles Up: The Conquest of the Upper Air, by J. Gordon Vaeth (New York: Ronald Press, \$4.50), pp. 207.

Space Medicine, published by a major university press, is evidence that the application of present means is well underway and that the limiting factor is not the machine itself but man in relation to his machines. The chapter headings and notations of the author's official connections are perhaps sufficient commentary: "Space Medicine in the United States Air Force," by Major General Harry G. Armstrong, the Air Surgeon General; "Multi-Stage Rockets and Artificial Satellites," by Werner von Braun, Ordnance Research and Development Sub-Office (Rocket); "Physiological Considerations on the Possibility of Life Under Extraterrestrial Conditions," by Hubertus Strughold, Department of Space Medicine, USAF School of Aviation Medicine; "Astronomy and Space Medicine," by Heins Haber, Department of Space Medicine, USAF School of Aviation Medicine; "Orientation in Space," by Paul A. Campbell, Colonel (MC), USAF Reserve; and "Bioclimatology of Manned Rocket Flight," by Konrad Buettner, Department of Space Medicine, USAF School of Aviation Medicine.

A Handbook of Space Flight, by the editors of *Journal of Space Flight* and *Rocket Abstracts*, is designed to "provide in an assembled and collected form, a sequence of tables and tabulated information . . . especially useful for the investigator in the field." Divided into five major sections, "Properties of Materials," "Physical Data," "Astronomical Data," "Rocket Data," and "Miscellaneous Data," the *Handbook* offers 94 separate tables, most of which will be of limited interest to the general reader. Exceptions to this stricture are table 93, a "Dictionary of Words Used in Rocketry and Space Flight," and table 91, a list (as of 1950) of "Known Rocket and Space Flight Societies." Twenty-three organizations are listed. Eleven of these are American. The others are in eight foreign countries. No Russian listings are given.

The subject of Vaeth's *200 Miles Up* is the "highest flights that have yet been achieved by man-made objects." Except for some concluding speculative paragraphs, Vaeth rigidly limits his exposition and narrative to experiment and accomplishment that are a matter of record. His book is the best account available of the technical and scientific advances thus far made in applied rocketry and in the very important field of upper air research. For the reader who is interested in the things-as-they-are approach to rocketry and upper air research, *200 Miles Up* is required reading.

Whether sober scientists or unrestrained amateur enthusiasts, those who engage in astronautics are characterized by unlimited imagination and what must seem to the uninitiated, fanatic zeal. If the reader of any or all of these five books cares to ponder what *may* happen to mankind when the journey into space has become large-scale and routine, I recommend to him a sixth book, a work of pure imagination—*The Martian Chronicles*, by Ray Bradbury.

USAF Historical Division

Russian Geography

DR. LITTLETON B. ATKINSON

FOR anyone concerned with studying, analyzing, and interpreting aspects of the geography of the Soviet Union this volume* provides an invaluable reference aid. It is comprehensive in coverage, encyclopedic in content,

**Geography of the U.S.S.R.: A Regional Survey*, by Theodore Shabad (New York: Columbia University Press, 1951, \$8.50), pp. 584.

and convenient in arrangement. But, for all its excellence, the fact should be stressed that the book will serve more satisfactorily as a source of information than as an instructional text or an introduction to Russian geography for the general reader.

The basis for the book is a card file of more than 10,000 entries maintained by Mr. Shabad, who, as a cartographer, journalist, and assistant editor of the *Columbia-Lippincott Gazetteer of the World*, has collected and sifted information on the Soviet Union for a number of years. He is especially interested in "the changes in the territorial-administrative pattern [which] . . . reflect accurately the development of the economy of the U.S.S.R." By spotting such changes the author is able to locate with certainty significant industrial developments, whether in the form of new enterprises or in the expansion of older ones, in the Soviet Union. Moreover, through such methods, the author has found it practical to adapt the regional plan used by leading Soviet geographers in his review of what actually exists in the way of population, physical features, resources, and economics in particular areas. In fact Mr. Shabad stresses that current problems and existing conditions are emphasized throughout his book, notably those reflecting political and economic patterns. He does not attempt to present the broad background of Russian geography, but concentrates upon surveys of the various regions after a brief presentation of the physical setting, the political framework, and the economic pattern of the U.S.S.R.

For the Russian Soviet Federated Socialist Republic, the largest and most developed of the member republics, the survey treatment is lengthy and extremely detailed, with each of the regions divided into its constituent *oblasts* or sub-regions. The remaining republics are dealt with just as thoroughly, but necessarily occupy fewer pages individually. Throughout the discussion of each region there are appropriate black and white full-page maps. Every effort has been made by the author to give the latest available information and to include the place names shown on the accompanying maps.

Not the least valuable features of the volume are its population tables, the selected bibliography, and, most useful of all, a 62-page double-column index giving approximately 4,000 place names mentioned in the text and shown on the 55 maps in the volume. Possibly the most obvious shortcoming of the book from the standpoint of the research or intelligence worker is the absence of documentation for the information its crowded pages contain. The bibliography does not make up for this lack. However, this is a minor criticism of a work which must stand as a monument to painstaking effort on the part of Mr. Shabad and as an example of a well-organized and extremely useful reference tool.

Another recent book* studies Russian physical geography and is primarily intended for college-level students. Within these limits, he has succeeded in producing a sound, informative work. Certain areas of this vast land are practically contiguous with the North American continent, and probably less is known generally of the far eastern outlying areas of the U.S.S.R. than of those areas which lie in closer proximity to Europe. In consequence, Mr. Mirov has devoted more weight to such regions as the northeastern coast of Siberia and the peninsula of Kamchatka than is usually the case.

In the first 50 pages, the author discusses Russian geography as a panorama in order to lay the setting. In part 2, he engages the reader in an interesting survey of the myriad racial and language groups within the Soviet Union. Part

**Geography of Russia*, by N. T. Mirov (New York and London: John Wiley, 1951, \$6.50), pp. 362.

3, by far the longest section in the work, devotes itself to a meticulous, concise study of the physical geography on a regional basis. The author's principal interests in this portion of the work, and which is fully justifiable in a study devoted frankly to a physical description of the U.S.S.R., are leveled at topography, climate, vegetation, and animal life.

Although there is no formal bibliography at the end of the work nor at the close of chapters, Mr. Mirov has been careful throughout the work to footnote his citations.

It lends a ring of validity to a work on Russian geography when, as in this study, the author can make assertions concerning certain physical characteristics giving as his authority "personal observation." We have far too little first-hand knowledge of Soviet Russia, in geography as in other fields, and the writer who combines a scholarly grasp of the materials available outside the Soviet Union with personal experience is making a contribution which is doubly valuable.

Mr. Mirov has been generous with maps and charts. His maps delineate in detail the various areas of the Soviet Union as to boundaries, geologic formations, topography, glaciation, weather, ethnic groupings, religion, geographical regions, and vegetation. However, it is to be regretted that no list of illustrations was included.

Research Studies Institute, Air University

BRIEFER COMMENT

Red China's Fighting Hordes, by Lt. Col. Robert B. Rigg, pp. 378.

An important eyewitness picture of the Chinese Communist Army by an experienced American officer who marched with them as their prisoner. More valuable in its comments on organization, training, composition, and tactics than it is on the grand Chinese strategy.

Military Service

Publishing Co., \$3.75

Shanghai Conspiracy: The Sorge Spy Ring, by Maj. Gen. Charles A. Wiloughby, pp. 320.

The documented account of the remarkable career of the Russian spy, Richard Sorge, who infiltrated agents into the highest circles of the wartime Japanese Government. His successes included a prediction of the Japanese attacks on the United States in 1941. Good breakdown of the pattern of Soviet espionage.

E. P. Dutton, \$3.75

The Peculiar War, by E. J. Kahn, Jr., pp. 211.

A roving reporter for *New Yorker* recreates the day-to-day life and vicissitudes of United Nations soldiers and airmen in Korea in the spring of 1951. Shows the bitter, vicious air and ground skirmishes so grotesquely underplayed by mention in one line of a communique. Vivid and amusing, reminiscent of Ernie Pyle.

Random House, \$2.75

Communism in Western Europe, by Mario Einaudi, Jean-Marie Domenach, and Aldo Garosci, pp. 239.

The book contains three thoughtful analyses of the sources of strength and the recent history of the communist movement in Western Europe. The detailed and informative sections on the French and Italian Communist parties are especially welcome because they are handled by informed writers from those countries.

Cornell Univ. Press, \$3

How Strange Is Russia? by T. Zavalani, pp. 244.

Five years as a student and party functionary in Moscow has given this Albanian author first-hand authority in his demonstration of the flaws and weaknesses in the Soviet industrial, military, and agricultural build-up. A maze of bureaucratic red tape, timidity, and incompetence has consistently kept production far below planning estimates.

Fredrick A. Praeger, \$4

American Democracy and Military Power, by Louis Smith, pp. 370.

An interesting, well documented, and comprehensive presentation of the theory, historical background (from 1789 to present), constitutional law, and administrative practices in the American system of civil control of military power. Shows how past civilian leadership has been retained through interpretive flexibility and executive devices based only on Constitutional provisions created by men who had no conception of twentieth century America as a world power or the influence the military may some day have on every phase of national life and policy.

University of Chicago Press, \$5

Men of West Point, by R. Ernest Dupuy, Col., U. S. A., Retd., pp. 486.

Supposedly the story of the first 150 years of the United States Military Academy, this volume is a general and rather sketchy account of United States military history, spotlighting the role, activities, and achievements of a limited number of well-known West Point graduates.

William Sloane Associates, \$5

The Secretary-General of the United Nations: His Political Powers and Practice, by Stephen M. Schwebel, pp. 299.

A study of the unique and strategic position of the chief permanent officer

of the United Nations—the Secretary-General—who officially speaks for the world. Analyzes all phases of this office insofar as they bear upon and lend to the Secretary's power.

Harvard University Press, \$4.75

The Defense of Western Europe, by Drew Middleton, pp. 313.

Head of *New York Times* European News Bureau attempts to assess the problems, methods, and progress of NATO in building West European defense; the effect of rearmament (including West Germany) on Europe and Soviet Russia; and the mental and physical preparedness of Europe for the struggle ahead.

Appleton-Century-Croft, \$3.50

Russia Absent and Present, by Wladimir Weidle, pp. 153.

Analyzes the social and cultural forces which have contributed to the Russian outlook with little emphasis on politics and Tsars. Paints the Russian as an imaginative artist, capable of constructive thinking but too often the victim of circumstances.

John Day Co., \$3

Basic Documents of International Relations, ed. by Frederick H. Hartman, pp. 312.

Collection of significant documents on international relations from the Treaty of Chaumont (1814) to the North Atlantic Pact (1949). Insures finger-tip familiarization with basic issues of our times.

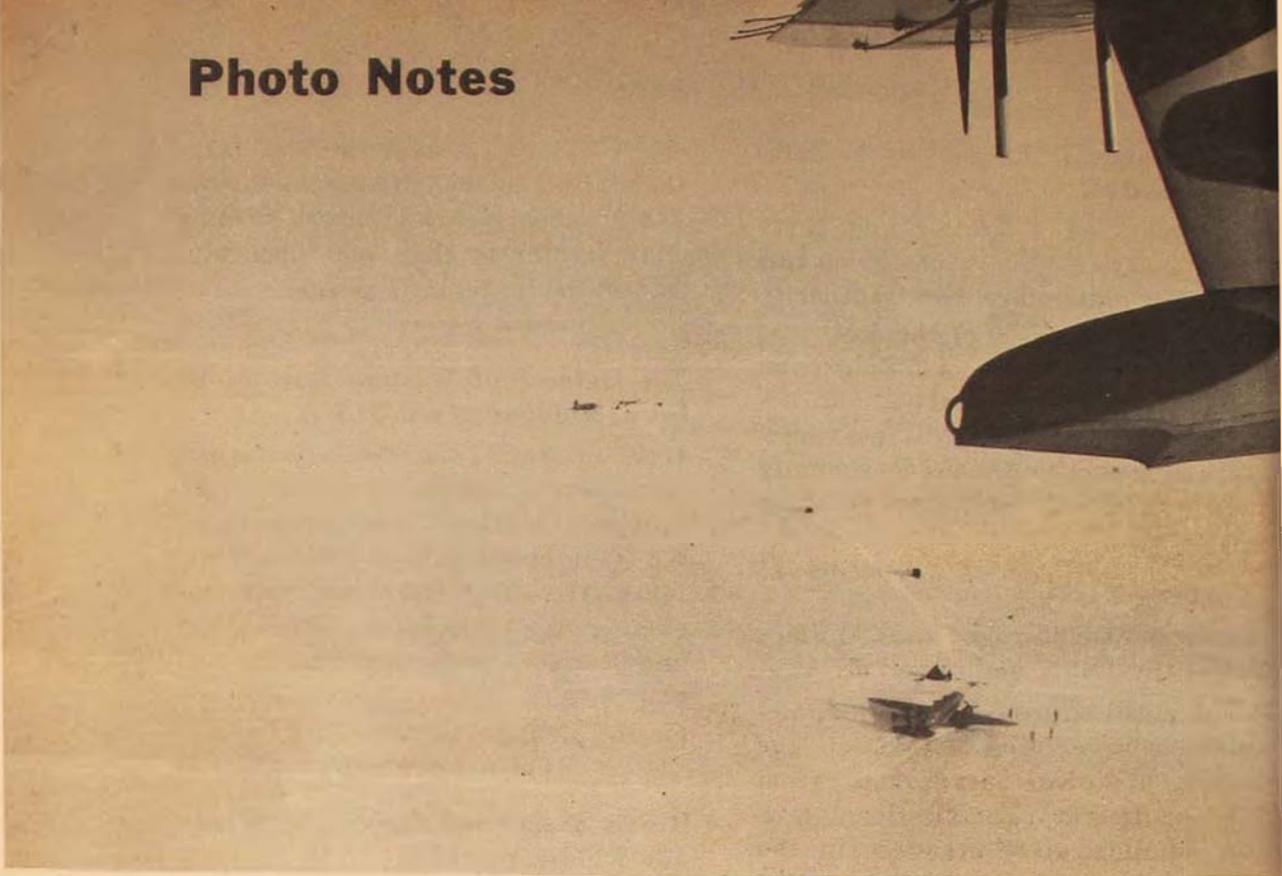
McGraw-Hill, \$3.25

Christian Democracy in Italy and France, by Mario Einaudi and Francois Goguel, pp. 229.

Christian Democracy is the greatest force stabilizing Italy and France against Communist inroads. Two authorities trace the history of the movement which brought about conciliation between the temporal and spiritual world.

Notre Dame Press, \$4

Photo Notes



Taken from a USAF SA-16 circling for a routine landing on snow-crested, floating ice island T-3, this photo shows the USAF weather observation station. First aircraft to land on T-3 was a ski-equipped C-47 on 19 March 1952. Since then other aircraft, including C-54's have landed and taken off from this new and unique AF installation.

The Strategic Arctic

Air strategists, searching for global routes and bases in this global air age, have new interest in the barren wastes of the Arctic. Alaskan Air Command B-29 Ptarmigan reconnaissance has discovered potential Arctic bases in three huge fresh-water ice islands. The largest now boasts a weather station. The search continues for the origin of these icy "flattops."

This C-47 sits atop the geographical North Pole after a flight staged from the base on T-3. After recording scientific data, the expedition erected an oil-drum monument containing sealed messages. When these are found at some future date, their new position will furnish information on direction and flow of Arctic Ocean currents.





While inspecting the ice shelf off the coast of Canada's Ellesmere Island (northernmost point of known land within the Arctic circle) for possible origin of fresh-water ice island T-3, expedition members on 4 May 1952 spotted a man-made landmark on top snow-covered Cape Columbia—more than 1,000 miles north of the Arctic Circle. Making an unscheduled landing, they found three broken sled runners lashed together with a piece of wind-frayed manila rope—a Peary expedition cache (shown above). Four wood-crated metal boxes, presumably containing food and supplies, were lodged under the tripod. Nearby stood a cairn with a protruding signpost. Battered by decades of fierce Arctic winds, the partially broken sign post dangled by heavy sounding wire used for guying. This site marked the land point from which Admiral Peary's expedition began its 53-day, 826-mile round trip to the North Pole 43 years ago. Inscribed dates found here varied with those in Peary's account. Eternal daylight in these latitudes at this season could readily have caused the error. The USAF party collected rock samples near the cache for comparison with those found on T-3. It is believed that many centuries ago T-3 broke off from the Canadian shelf ice.



A powerful tactical air striking force was recently added to NATO by the transfer of the USAF's 49th Air Division from Langley AFB to England. While the ground echelons moved by water, the 4-jet B-45 light bombers of the 47th Light Bomb Wing and the speedy and versatile F-84G fighter-bombers of the 20th Fighter-Bomber Wing hopped the North Atlantic without incident via Goose Bay, Labrador, and Keflavik, Iceland. Shown here, parked on the ramp at Langley prior to departure, aircraft of the 49th receive final checking. The 550 m. p. h. B-45's have a combat radius with tip tanks of over 1,200 miles and a bomb-carrying capacity over 20,000 pounds. The F-84G's, battle-proven in Korea, are in the 600-mile-per-hour class and are equipped for in-flight refueling. On recent tests the F-84's flew 4,775 miles nonstop, refueling from KB-29 tankers, and accurately dropped their bomb load midway in the flight. Transfer to NATO of this striking force is indicative of growing USAF air strength.

New weapon in our air defense arsenal is this F-94C Starfire all-weather fighter-interceptor. It is powered by a 6,250-pound thrust J-48-P-5 jet engine with afterburner, supplemented by two 1,000-pound thrust RATO packs under the fuselage. A drag chute cuts down landing roll. Capable of operating at speeds of 600 miles-per-hour and at altitudes above 45,000 feet, the F-94C is unique in that its main armament



consists of 24, 2.75-inch rockets which are ranged, aimed, and fired electronically from the ring of tubes around the black-domed radar nose. The rocket doors are closed in flight, snap open before firing. Wing rockets, 1,000-pound bombs, or napalm tanks can be attached under the thin, sturdy wings.



This USAF officer is demonstrating to Korean fighter pilots how to hit the water safely and quickly and get into their dinghies after bailing out of a disabled aircraft. The small one-man dinghy which is attached to the parachute harness is already credited with saving a number of pilots who were forced to head their planes for open water and bail out after sustaining serious damage over enemy territory. Main advantages of the dinghy over the old type Mae West life preserver are that it does not make a bulky layer around the pilot's chest, it keeps the individual out of the water, eliminates the fatigue of swimming in heavy clothing, is easier to paddle in a continuous direction, and is much easier to spot from the air.



The Periodical Press

Karl J. Peltzer, "Resettlement in Malaya," *The Yale Review*, Spring, 1952, pp. 391-404.

THOUGH Communist activities in Malaya have been in full swing since June 1948, the urgency of dealing with the Malayan problem was brought to a head by the assassination in October 1951 of Sir Henry Gurney, British High Commissioner to the Federation of Malaya. Militarily the British had lacked adequate force to cope with the problem (some 25,000 Commonwealth troops were fighting in Korea). Mr. Pelzer, a member of the Department of Geography at Yale University, and student of population problems, points out other problems, such as the extreme difficulty of operating in the jungle against guerrilla tactics. Moreover the Communist Malayan Peoples' Liberation Army has never wanted for recruits, and its size was determined, so far as Pelzer could tell, by the number of small arms available to them.

Of greater significance to Communist guerrillas is food. They either cultivated it in secluded areas of the jungle or obtained it by foraging or intimidating the natives in outlying areas, who, like the Communists are mostly Chinese, and who straddle the fence politically. The dual problem which the British attacked was to deny the Communists the chance to extort their food supply from the natives, and to relieve the racial tension which has been the Communists' main talking point.

Today, Pelzer points out, 44 per cent of Malaya's population of 5,000,000 are Malays; 38 per cent are Chinese; 10.8 per cent are Indian, and less than 7 per cent European. Malays have always feared Chinese numbers and contend that inasmuch as the British originally introduced Chinese and Indians into the tin and rubber country, Britain should solve the problem.

Britain originally met the challenge in part by reserving higher positions in Malayan Civil Service to Malaysians, by establishing Malay Land Reservations, and in general favoring native groups. This was promptly and hotly attacked by Chinese group as highly discriminatory. The Communists, according to Peltzer, undermined the plan by setting up unions controlled by themselves, infiltrating government-sponsored unions, and causing general labor unrest. They also intimidated hard-working, self-sufficient Malays and appealed to the numbers of squatters impoverished by local unemployment.

A plan for widespread resettlement was drawn up to counter Communism by removing provocations and by easing racial tension. Though conceived in the late forties, it was not put into operation until 1950. By November of 1951, some 350,000 squatters were settled or resettled on land capable of supporting them, and were isolated from guerrilla influence by barbed wire and strategically located police posts. In Johore, Peltzer found each settler was given a "disturbance allowance" of 70 Straits dollars, 6 months' subsistence, materials for a home, and $3\frac{1}{8}$ acres of land for cultivation, a plan he believes is apparently working. He says that native appreciation is great, though squatters preferred to be moved by force as a defense argument against any future Communist reprisals. "After care" is administered in the form of schools, hospitals, community radio sets, and similar material concessions, and by encouraging young people to take part in welfare activities like the Boy Scouts. The test of success,

Peltzer says, is when settlers volunteer information about the Communists, and when they organize home guards and share police and patrol responsibilities. Plantation workers are discouraged from living in isolated locations and facilities for their protection are set up in large compounds.

The author sees hopeful signs that race antagonism can in large measure be done away with by the newly proposed interracial primary schools, and by the emergence of the Independent Malaya Party, a cooperative composite of Malay-Chinese leadership. He feels that the resettlement program which tends to ease racial tensions may go far toward assuring the political stability of Malaya.

Arthur Spencer, "Soviet Pressure on Scandanavia," *Foreign Affairs*, July 1952, pp. 651-659.

NORTHERN Europe has traditionally tried to steer clear of involvement in the wars of its southern neighbors, though Norway and Denmark, both of which were occupied by the Germans in World War II, voluntarily joined NATO in 1949. Sweden has remained warily neutral and well-armed. Finland, conspicuous by its silence on world matters for many years, shocked sensitive observers by the recent announcement of Premier Kekkonen on 23 January 1952 that "peace in the northern countries" is a prerequisite to peace in Finland.

Spencer, Scandanavian correspondent for the London *Economist*, feels that subtle pressure from the Soviet Union inspired the speech. He finds further evidence of pressure on these nations in the Copenhagen Meeting of Scandanavian Foreign Ministers in March 1952, where all agreed not to restrict movement of Russian diplomats. Norway, as Spencer points out, has been in bad grace with Russia since 29 January 1949, because of her independence in joining NATO and because of the controversy over Norway's Spitzbergen and Bear Islands which Russia chooses to consider a threat to her sovereignty. Sweden, the author believes, would "go it" alone under all circumstances short of actual invasion, although some observers believe that Russia has spared Finland to keep from pushing Sweden into the NATO camp.

Swedish foreign policy, according to this writer, has two distinct strands: (1) international collaborationism which has been spearheaded by Hjalmar Branting, and (2) caution and pursuit of economic advantages of a strictly neutral nature. "Alliance-free armed neutrality" is the overwhelming choice of the 380 members of the Swedish parliament, and Spencer believes Russia seeks to keep it that way until Sweden can be sucked into the Russian orbit. He thinks that an influx of friendly Russian diplomats into Sweden and a profusion of diplomatic parties coincident with the Ottawa meeting of Atlantic Foreign Ministers showed Soviet concern for Swedish neutrality. Similar pressures were exerted on Norway at the same time over her alleged commitments to NATO. The Russo-Swedish trade agreement which ran out in 1946 and which no one had taken the trouble to renew, was revived at a time when Sweden's pulp and iron goods industries were suffering. This move made excellent propaganda at the Moscow Economic Conference.

Spencer believes that Finnish overproduction when reparations are shortly paid off will put that nation in a poor position to refuse marketing temptations dangled before her by Russia. Moreover Finland's Communists now manage the once-owned German companies which were given to Russia as reparations (especially the Walholb concern and the Soumen Export-Import Agency), and the extensive profits derived therefrom put the local Communists in a very influential position within their own country. He believes that Premier Kek-

konen's speech was just another way of telling the Russians that in matters of major policy, Finland's interests were identical with Russia's Scandinavian interest, and hence there would be no need to invade the country.

Kenneth Younger, "Western Policy in Asia," *Pacific Affairs*, June 1952, pp. 115-129.

ASIA, according to this Labor member of Parliament and British Minister of State for Foreign Affairs 1950-51, is suffering from a number of internal conflicts which have great international significance. There is great reaction to previous colonial regimes, a resurgence of nationalism, a desire to get rid of economic backwardness, and the urge for freedom.

Foremost among these, the author claims, is their determination to improve their national economic structure. To do this they need technical advice and capital equipment. Asians are suspicious of imperialism and hope to adapt democratic procedures to their own needs, but they are anxious to establish cooperation with Western nations on a basis of equality. They wish to do away with landlords, money lenders, feudal chiefs, religious hierarchies, and all they feel fosters corruption. The author thinks that these problems have not been recognized by American foreign policy since 1945, although communism has been more sympathetic. Britain, Younger points out, left a governmental framework in India as a bastion against internal chaos after its withdrawal. But the withdrawal of imperial powers in Korea and Indochina has left a void which has been filled by a new set of masters who promise land for peasants, tractors, fertilizers, and transport and industrial apparatus, not merely the sophistications of parliamentary democracy.

Asians, he contends, have great aversion to fighting other Asians involved in Western struggles. They are more concerned with embarking on self-government, making good the war damage, and reviving production and trade. The Chinese problem, for example, he feels to be the outcome of a relatively natural Asiatic development, and not so much a Moscow-directed plot.

America is not interested in colonialization, but had traditionally sought to limit European penetration so that its own trade might flourish. This stand he finds basically incompatible with the present support the United States is giving to European nations in colonial areas. He feels the real reason for American support is based solely on the resistance those nations offer to communism. America's policy of "containment" has grown out of what it considers China's shift from the free world camp to that of Soviet Russia, and has resulted in the North Atlantic Treaty, Middle East Defense Treaty, and similar traditional power alliances. These Younger considers to be outside the framework of the United Nations and therefore unfortunate.

Younger believes that India is less vulnerable than the West to communism's charges of racial discrimination and imperialism. Hence it is the West's chief weapon with which to work for peaceful coexistence in Asia. He thinks that the Central People's Government of China might have been more favorable toward the West if it had been recognized internationally and permitted to represent China. He frowns on the consequences of the United States blockade of China and condemns talk of bombing Manchuria as pure jingoism. Japan, he contends, will have great trouble becoming a democratic country if the West denies it access to the trade of Asia, which is largely Chinese.

Yet these problems do not seem insurmountable to him. Younger recommends (1) that the West enlist India and Japan as mediators in Asia; (2) that the West send economic aid to backward areas of Asia; (3) that France, Japan,

and the United States follow Britain's lead in recognizing Red China; and (4) that economic aid be divorced from strategic planning. He concludes his thesis by saying that if the economic machinery of the United Nations is developed and nurtured, Communist countries and Asiatic fence-straddlers will soften their attitude toward the West and cannot remain indefinitely aloof.

Vice Admiral Leslie C. Stevens (Ret.), "The Russian People," *The Atlantic*, May 1952, pp. 27-33.

WHILE serving as naval attaché to Moscow from 1947 to 1949, Admiral Stevens, a lifelong student of the Russian language, literature, and culture, made many significant discoveries about the Russian people.

Russian life, he contends, is full of dualities and contradictions which we see as deviousness and cunning. The impostor or self-anointed has always flourished there as in no other land. Secretiveness and suspicion are Oriental influences as peculiar to Russian culture as Gaelic effusiveness is to English. Blackmail, spying, provocateurs, and the physical and moral pressures that have grown up with the country he thinks find root in the mists of history. Contrary to Western opinion, the author found wide evidence of self-respect and fierce personal pride in the Russian's nature, though there exists a great tendency toward self-abasement.

The Russian has great charm when he is frankly a Russian, the author points out, but he is at his worst when trying to be European. Because his culture, language, and governing power stems from the Great Russians—a Eurasian people—he resents being referred to as "Asiatic." By the same token, peoples from northeast Asia and the Mongolian steppes who have infused what the author considers the finest, most appealing, and colorful flavor into Russian life, resent categorical definition as "Russians." It is from them that the love of proverbs, respect for and love of office, lavishness, fondness for jewels, gold, horses, and complex attitudes towards women are derived.

Widespread material poverty is due not so much to lack of materials and resources, but to the sense of timelessness, the patience, the insensitivity to trifles, and the lack of foresight he believes inherent in the Russian nature. This country never experienced a Renaissance or Reformation as did the West. It was continuously exposed to wars and invasions. Serfdom has stamped its imprint into their character, but Great Russians are essentially a decent folk with well-developed conscience, individualistic, and with a high degree of inner independence beneath the outward expediency of conformance. They have never known organized safeguards of the individual against government and authority, but unlike the disciplined Germans, they have never given unqualified acceptance to any authority.

Another anachronism to westerners, Admiral Stevens points out, is the impersonality of abuse (Russians are surprised that Americans are offended by the violence of Soviet propaganda), and the relative freedom to blow off steam about nonpolitical matters without official censure. He cites several cases of reckless driving, drunkenness, and disturbance of the peace which he saw handled with more tolerance and gentility by the dreaded MVD than they would in the United States at the hands of New York or Chicago police.

Politics is completely in the hands of the two per cent of the population who are members of the Communist Party, and not the slightest infraction of rules is tolerated by this group, who, Stevens feels, still consider the revolution to be in progress. The Russians fear capitalism and what they believe are its internal laws. They fear that inexorable capitalism, lacking expanding mar-

kets and faced with recurring domestic crises, will force the West to attack them. They realize they are unobjective and that they are given only one side to the story. But while realizing that all that is told them is not true, they feel compelled by circumstances to accept a master from among themselves rather than submit to foreign domination. Moreover, Soviet leaders, the author points out, are not reckless gamblers nor adventurers such as surrounded Hitler.

Stevens suggests that America court the Russian people, but not make the same mistakes the Germans did in the Ukraine, where Gestapo methods reversed the early understanding and sympathy of the Russian inhabitants. He believes our policy should show in every possible way that we know the Russian people are not responsible for communism or the present difficult world situation.

Martin W. Wilmington, "The Middle East Supply Center—A Reappraisal," *The Middle East Journal*, Spring, 1952, pp. 144–166.

AFRICA, since before the turn of the century, has formed a strategic bulwark of political and military equilibrium for Europe's principal colonial powers, Britain and France. England's defense of the whole Middle East and maintenance of her lifelines to India, Malaya, and China were almost entirely dependent upon the role of Egypt and the Suez Canal. In two world wars, the Allies increasingly appreciated the value of their Middle East supply depot, both against the organized resistance of the Ottoman Turks (1914–18) and Germany-Italy (1939–43), and against sporadic nationalistic uprisings of various Arab factions. MESC, as it came to be called in World War II, was a joint British-American technical-logistic team with broad judiciary powers over shipping and other phases of regional economics pertinent to Middle East defense as well as being a clearing house for supplies. It was farsightedly intended to transcend purely military considerations.

A corps of specialists, including many civilians, brought order out of chaos, and evoked a degree of respect, albeit a grumbling respect, from dissident factions throughout the area. Its effectiveness spelled quick defeat for Rommel in 1943, and until its dissolution at the end of the war, its stabilizing influence cushioned the birth pains of Arab nationalism.

MESC points with pride to its program of curtailment of nonessential luxury and "semiluxury" goods, and its attempts to coordinate production and distribution of needed items in 18 Middle East countries. Its economic assistance to backward areas under the pressing necessities of war, and without being accused of having a "white man's burden" approach, laid the perfect groundwork for postwar rehabilitary measures such as the Marshall plan. Ironically enough, the United States dissolved its connection with the organization when peace was restored, and entered a period of economic competition with its former partner. Even so, a wider degree of participation by lesser nations might have perpetuated a working model exemplifying the virtues of international cooperation and mutual assistance.

After 1946 America not only supplied the bulk of the arms and wherewithal for European recovery (Britain was dedicated almost entirely to supplying its own domestic demands and those of Europe), but at the same time made competitive inroads into markets theretofore British. Such parting of the ways has had grave repercussions, only recently felt and only partly appreciated. How well old-time cooperation can be restored remains to be seen.

The military person, as the author points out, should be familiar with the economic implications of MESC's administration in areas of increasing world importance.

BRIEFER COMMENT

Norman D. Palmer and Shao Chuan Leng, "Organization of the Chinese Communist Party," *Current History*, July 1952, pp. 13-19. A lively analysis of the prevailing Communist philosophy of "Democratic Centralism," of the nature of the party, its membership, and organization. The authors feel that Chinese individuality, faced with the peculiarities of administering the new China, is paying a dutiful lip service to Moscow while dreaming of a new brand of nationalism of its own.

Alex N. Dagnich, "Tito Withstands Russian Domination," *Current History*, July 1952, pp. 23-27. Through the coincidence of the personal loyalty of his followers and their indignation towards the inconsistency between Russian word and deed, Tito has preserved the independence of what was considered in 1945 the staunchest Soviet satellite.

Robert Barrat, "The Stakes in the Indo-Chinese War," *The Commonweal*, May 2, 1952, 91-93. A Frenchman contemplates the gloomy situation in Indo-China and suggests a higher motive for French action than imperial despoilment. He proposes widespread publicity be given the contention that it is the community of free nations that France is defending, not its own resources or prestige.

M. N. Roy, "Democracy and Nationalism in Asia," *Pacific Affairs*, June 1952, pp. 140-141. The failure of democracy in Asia is accounted for by the same set of axioms that have produced nationalism—the authoritarian tradition of Oriental culture, the extent of ignorance and the cultivation of submissiveness as a virtue. All of these militated against democracy, but found expression in a brand of nationalism particularly suited to the ends of communism.

Lt. Col. John S. Zimmerman, USA, "Arctic Airborne Operations," *Military Review*, August 1952, pp. 23-30. The strategic location of the world's eight great industrial areas all touch on one world region—the Arctic. This alone calls for a re-examination of modes of Arctic operation, methods of training and equipping Arctic troops, their employment, and what can be expected of them.

Maj. Robert C. Faylor, "Engineers Face the Arctic," *Army Information Digest*, August 1952, pp. 11-18. Modern engineering problems associated with Arctic operations are recounted by an Army consultant experienced in airstrip and ground installation construction in the far north.

The Quarterly Review Contributors

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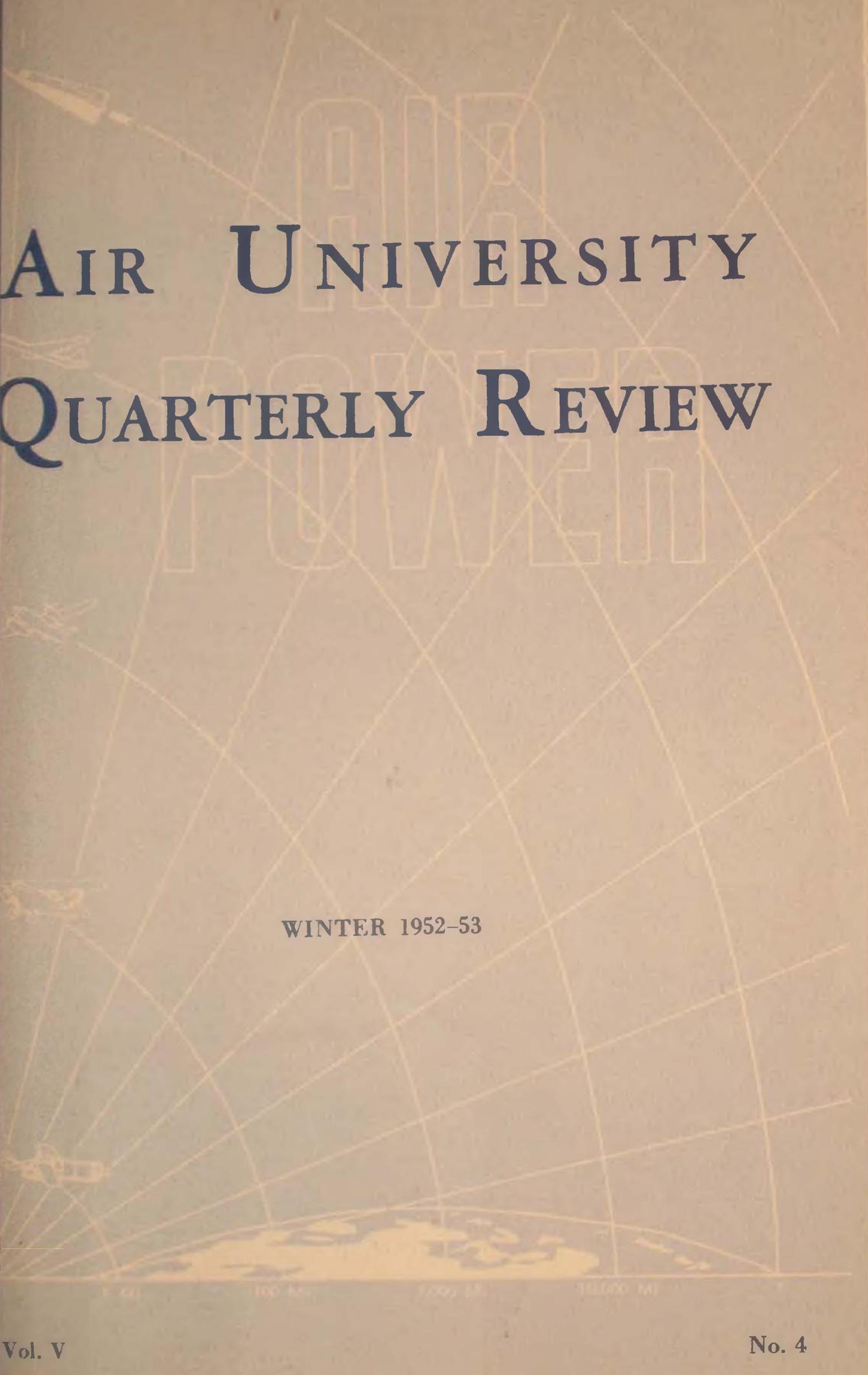
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