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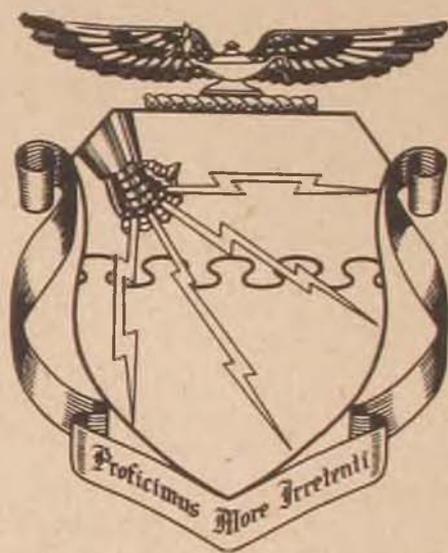
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# INDUSTRIAL MOBILIZATION FOR AIR WAR

*Major General Oliver P. Echols, USA (Ret.)*

IT IS DIFFICULT to understand why this country, the greatest industrial nation on earth, went into the first World War depending to win on manpower alone. Machine guns, artillery, tanks, and airplanes were being produced in what then were large quantities by the French, British, and Germans. Our artillery units were equipped entirely with French guns, although many of them were manufactured in America under French supervision. As for American built airplanes, there were very few flying in France until after the Armistice. In spite of the fact that we had the grandest army of "Dough-boys" the world had ever seen, the remark that we were a nation of "stout hearts" but "thick skulls" seemed apropos. Why was it then that we had no airplanes, and were very deficient in other types of materiel in France? A short review of the history of industrial war planning can provide the answer.

The Germans started the industrial mobilization planning business prior to the Franco-Prussian War of 1870 and had an extensive industrial mobilization plan and logistical program set-up for World War I. This was the beginning of industrial mobilization planning as we now understand it.

In the United States the pioneer in this field was Bernard Baruch. Mr. Baruch's excellent report on the organization and work of the War Industries Board, of which he was in charge, was the basis of the course in the Army Industrial College. All industrial planning done at this time was based on the assumption that when an emergency came, a so-called super-agency would be created immediately, and this agency would take control and implement the plans. Mr. Baruch, in his appearance last fall before the Senate Committee investigating the National Defense Program (in connection with the Senate Hearings on the failure of the Government to make

effective use of such mobilization planning as was done prior to World War II) stated in part as follows:

"In November 1918 we drew up an outline at the War Industries Board covering America's participation in the First World War. I sent it to President Wilson, and he accepted it as the Mandate for existence. It is as true today as it was on November 10, 1918. It will be equally true of the next war, which the fates forbid.

"If I am to be pinned down as to its economic and industrial aspects, then I say to you that because of our foot-dragging and fumbling, because of our inability to apply corrective methods when they were clearly indicated, the war cost us, unnecessarily, thousands of lives, extra billions of dollars, and months of time. This is my firm conviction based upon an intimate association which is demonstrable.

"When the War broke out they started *de novo*: They started with the Council of National Defense, and then the Office of Production Management, and then the Supplies Priorities and Allocations Board, and the War Production Board were successively organized, each with a little more authority than its predecessor, and the War Production Board had no authority over the War Manpower Commission."

Consequently, at the beginning of World War II, this country started from scratch, and not until fairly late in the war, when the Office of War Mobilization was organized, did we catch up with Mr. Baruch's plan of 1918.

Harvard University, in a recently published study undertaken upon request of the Air Force and the Bureau of Aeronautics, listed the following as the principal factors limiting the acceleration of airframe and engine production prior to World War II:

- (1) The absence of a unified national will to support industrial mobilization prior to Pearl Harbor.
- (2) The lack of fully developed, tactically useful models.
- (3) Problems of government management of the aircraft production program.
- (4) Problems of converting to wartime production techniques at individual airframe and engine plants.
- (5) Administrative problems of company managements.
- (6) Shortages of facilities, materials, and manpower.

The first item listed above easily overshadows the others. Actually, the remaining five factors are inherent in and are directly attributable to the absence of a *unified national will* to support industrial mobilization.

LET US NOW briefly outline the record of Air Corps planning between World Wars I and II. During this period the Air Corps did a great deal of work on industrial planning. It did the best it could under the circumstances. Planning officials computed requirements for major items and reduced these to components; estimated requirements for basic materials and commodities; calculated needs and made surveys for machine tools and facilities. From a technical viewpoint the plans were excellent, but they were not realistic. The industrial planners were cloistered people. They were separated too far from current procurement and day-to-day problems. They assumed too many things: that the nucleus of an aircraft industry would spring up overnight; that there would be a modern aircraft in existence ready for production at a given time; that there would be a super-agency brought into existence on M-Day to coordinate the efforts of the various agencies of the government. They also assumed, of course, that we would have plenty of time to prepare.

What actually happened when the emergency came? Almost the first question which is asked in regard to any plan is: When does it go into effect? All previous planning used the expressions "at the beginning of the emergency," "on M-Day," and "upon the declaration of War." (Present plans are based on a "period of warning.") As far as World War II is concerned, in regard to the aircraft production program, the emergency started long before we began producing airplanes.

We had operated for many years on the old "Morrow Board Program" of 1926 which provided 2200 planes of all types for the Army, and 1200 for the Navy. This program, which initially received the support of the Administration and Congress, had, mainly for budgetary reasons, degenerated to the point where we had only a small percentage of the planes authorized, and most of those on hand were so obsolete they were almost useless except for elementary training. There were a few, perhaps 200 airplanes, which were considered

modern, but these in general were without armament, radio, leak-proof tanks, bomb sights, and other necessary items of combat equipment. The criteria was "What does it cost and is it safe to fly?" Nothing else mattered.

In 1938 General Arnold went to Congress with his 5500 plane program. By this time Congress was alert to the need of doing something, but 5500 planes cost a lot of money and the legislators feared that if we bought so many planes at once they would all be obsolete at an early date and the money would have been wasted. Further, where were planes coming from? Who could build that many?

The argument continued, but finally the money was appropriated. However, we still did not know where we were going to get the airplanes. It was at this period in our history that the words "mass production" became a cliché. In the newspapers, the cocktail lounges, the streets, the clubs, etc., everyone, particularly those who knew nothing about airplanes, was talking about mass production of airplanes. It was the panacea. The saying went that the reason we did not have airplanes was because engineers were allowed to design them, aircraft manufacturers were allowed to build them, and the Services were allowed to change them.

The difficulties the Air Corps encountered in being permitted to work out its own destiny at this period are too numerous to mention. However, there are two salient points that deserve elaboration:

(1) The "mass production" thinkers, who, because there were so many of them, and because they were so vociferous, were influential and attempted to put then existing equipment in production. Had they succeeded, no one knows when, if ever, our Air Force would have gotten into the war. Our pilots would have had large quantities of older models of planes such as the B-18s, P-36s, P-35s and some even older than these, when Pearl Harbor came. It is to the everlasting credit of General Arnold and Mr. Louis Johnson that they backed the recommendations of the evaluation boards for production of the improved B-17, B-24, A-20, P-40, P-38, P-47, B-25, B-26, and other newer models for the 5500 plane program, even though they were generally unproven airplanes.

(2) The other point is that we were trying to buy airplanes from manufacturers who had limited facilities

to manufacture them except in very small quantities. Fortunately, at this critical time the British and French came into our market with orders for our new types and models. Most of our airplane manufacturers received their initial momentum from these orders.

IN THE SPRING of 1940 Mr. Roosevelt came out with his famous "50,000 plane program." This, of course, was the initiative which gave the real impetus to aircraft production. The President did not define his directive. He wanted 50,000 airplanes and there was considerable urgency about it. He did not say what airplanes, or what production rate he wanted, or who was to buy them or who was to use them. At the time, this seemed to be a rather generalized and confusing approach to the problem. Where do you start? Where do you stop? And who does it? Later it became apparent that this approach had many advantages. Had the Baruch Plan been in effect, had our own industrial plans been more up to date and realistic, we probably would have known where to go and what to do, or at least we could have asked some questions of higher authority. But as there was no higher authority, there was no way of "passing the buck up," so the Army Air Corps and the Navy Bureau of Aeronautics sat down and agreed on a program. The Army was to take 37,500 planes and the Navy 12,500. The Air Corps program was based on "mass production" of the types and models which were already under way in connection with the 5500 plane program. This new program was coordinated with the then newly created Council of National Defense, headed by General Knudson.

Shortly after that troubles began. Most of them stemmed from a lack of high level planning and direction and from the general disagreement in the government, the Congress, the press and the country as to whether or not the emergency had started. Some of the difficulties which seemed insurmountable at that time were:

- (1) A small organization accustomed to spending a few millions per year was now faced with the problem of spending two billion dollars in several months.
- (2) Manufacturers did not have the plants nor money necessary to build these airplanes. Banks were not

willing to furnish the money and the government had no financing policy.

- (3) The war had not started and American industry in general was not ready to support such an aircraft program.
- (4) The Air Corps was competing with industry for materials and facilities.
- (5) Mass production of airplanes was easy in theory, difficult in practice.

Concurrently with the 5500 plane program, and the 50,000 plane program, came the Air Corps program and the Lend-Lease program. The Air Corps program, the only one to have approved requirements as a basis, provided that GHQ Air Force have twenty-five completely equipped groups by September 1941, and fifty groups by April 1942. All logistical planning and thinking was based on this program. The entire supply system, including the organizing and training of depot squadrons and groups and the procurement of equipment and special vehicles and transportation was computed and scheduled on this basis alone. In addition, experience in the operation of full strength units under field conditions had been so limited that accurate prediction of consumption and replacement rates was a problem. No provision was made for attrition of airplanes or equipment, except at peacetime consumption rates. Further, due to the priority placed on Lend-Lease equipment at this time, the Air Corps program was making slow progress, although in the long run Lend-Lease was a boon from the viewpoint of production.

British and Lend-Lease orders for large numbers of planes soon became very welcome indeed because our production capacity was rapidly increasing and future business would be needed to keep the factories open.

WHEN THE 50,000 plane program was announced, it was decided to throw away the idea of buying so many airplanes for so many dollars, and buy productive capacity and rates per month. For example, on the 5500 plane program, orders for Lockheed P-38s were increased from thirteen to eighty-one airplanes per month; the P-47s to eighty-one also; and the P-39s to the same number. Some production

planners worried as to whether or not these small manufacturers could build that many airplanes in a year or two, and wondered if we were not wasting money by such a bold procedure. When the 50,000 program came the manufacturers were told to start increasing their capacity and to plan to build a specified number of airplanes per month, until told to stop. Subsequently, in many cases, the rate of production was doubled. If productive capacities were to be kept going orders had to be released from twelve to eighteen months ahead of the time delivery was expected.

Production quotas continued to rise. In January 1942 the President announced an American aircraft program of 60,000 airplanes for 1943 and 125,000 for 1944! He had upped the ante and insisted the new figures be met. The peak total eventually proved to be 96,000 aircraft in 1944 although that record could have been easily broken the following year if so many planes had been needed.

The 273 group program was set up following Pearl Harbor, and after the prospective aircraft production, as then planned, became known. General Arnold at that time stated that he did not know what would limit the size of the Air Forces program in an all out war--whether it would be airplanes, crews, fuel, or bombs.

When VE-Day came, the supply of bombs and gasoline was acute. We were trying to go all-out in Germany and build up the full power of the B-29s against Japan at the same time. Gasoline supplies could not be increased without reducing synthetic rubber; we could not produce more bombs without a reduction of artillery shells. These, of course, were Joint Chiefs of Staff level decisions and were beyond the purview of Air Force Materiel leaders.

Following announcement of the 50,000 plane program and the subsequent meetings of the Air Corps, the Bureau of Aeronautics, and the Council of National Defense, it became apparent that we could not have three aircraft programs--one each for the Army, the Navy, and the British. As a result, the Joint Aircraft Committee was organized. It was authorized jointly by the Secretary of War, the Secretary of Navy, General Knudsen's office, and the British Government. Without this committee we would never have made anything like

the progress we did. First, it prevented a duplication of effort. A single aircraft program was worked out which presented a solid front against all of the other numerous agencies and cross currents which were going on in Washington, particularly during the earlier and more confused period of the emergency.

The Aircraft Production Board came later,<sup>1</sup> and was superimposed on the Joint Aircraft Committee. It performed a useful function in giving the aircraft program a voice at court with the War Production Board, and was particularly useful in the scheduling of specialized parts and materials for aircraft use, as well as the coordination of manpower requirements and the utilization of manpower. Above the Aircraft Production Board was the Executive Committee<sup>2</sup> of the War Production Board. This committee was charged with the coordination of all production and had vast powers in regard to priorities, the supply and allocation of tools and materials, the scheduling of materials and components, and manpower priorities within the war program. After the Controlled Materials Plan was put into effect, the whole program began to move much more smoothly. Prior to that time it was an uncoordinated, unmanaged effort, with every agency fighting for its own program. It was a fight in which "no holds were barred."

It was a long and hard struggle. And after four and a half years we had only arrived at the point where Mr. Baruch was on 10 November 1948. He is again warning us that he fears we are preparing to make the same mistake a third time.

**T**HE NATIONAL SECURITY ACT of 1947 is only a few months old, and the problems involved, particularly from the viewpoint of the Munitions Board and the Resources Board, are many. It will mean more efficient and powerful air, land, and sea forces. However, as a result of the successive failures of the Council of Foreign Ministers, the Russian attitude in the United Nations, particularly in regard to atomic energy control, and the Soviet position with reference to the Marshall Plan, we should exercise a greater concern than seems to be the case.

<sup>1</sup>The author represented the Air Corps on this agency. *Editor.*

<sup>2</sup>The author represented the Air Corps on this committee. *Editor.*

In view of the world situation, logistical planning and plans for industrial mobilization should have a much higher order of urgency than they are now receiving. In 1939--during the "phony war"--*Time* magazine stated that Hitler's three best allies were: The English Week-end, the French Mistress, and American Indifference. Today, with the whole world talking about the "cold war," with the knowledge that the Marshall Plan can only succeed if backed by force, and with the knowledge that if it does not succeed we are an isolated nation in a hostile world, we are still making a rather casual approach to the problem.

We are again proceeding pretty much as we did prior to World War II. The Air Force and the Bureau of Aeronautics, through their subcommittees of the Air Coordinating Committee and the Aeronautical Board, are making every effort to prepare an intelligent plan. The Air Coordinating Committee report of 1945 on the demobilization of the aircraft industry is excellent. The Stanford study for the revision of this report and its estimate of the size of an aircraft industry required to meet the mobilization requirements, together with the Air Force and Navy Phase I and Phase II contracts with the aircraft industry for studies on expansibility, are all definite steps in the right direction. But, again, the Air Force, The Bureau of Aeronautics, and the aircraft industry cannot proceed alone. They can plan just so far. During World War II, the aircraft industry manufactured 80 percent of the airframes, but subcontracted a large part of the work. The aircraft engine industry manufactured only about 20 percent of the engines and transmitted its knowledge to the automobile industry, which in turn manufactured 80 percent of the engines produced. A very large percentage of the civilian industry of the country was converted to the manufacture of airplane components, parts, instruments, and accessories, and materials and tools for aircraft.

The Air Force and the Bureau of Aeronautics cannot at their level make any worthwhile plans for the production of aircraft beyond the planning now being done. Until a top level plan is made which provides for the allocation of a portion of industry (other than the aviation industry) to the air program, and overall plans for facilities, materials,

and manpower, the Air Forces can accomplish only a limited success.

From our past experience, together with a realization of the conditions which exist in the world today, we are led to the following conclusions.

(1) In World War II, without adequate planning, it required us four and one-half years to mobilize industry to the point where it was able to meet the requirements of the Armed Forces, and this without interference by the enemy. Due to the ever increasing complexity of the problem, it is doubtful that we will be able to do it again, even in this period of time.

(2) Planning from the bottom up is not effective, except to a very limited extent. To be effective, the plan must provide for immediate action and control at the national level in regard to requirements, schedules and priorities, allocations of materials, facilities, tools and manpower. On a peacetime basis, it will probably require from two to three years to prepare such a plan, and even under favorable circumstances at least two years is required to apply the necessary controls and to implement the plan after the emergency begins. However, such a plan is necessary while any danger exists that we are again to become involved in a total all out war.

(3) Due to the increasing effectiveness of Air Power, an all out mobilization plan is not enough. It is possible that we shall never again have an opportunity to mobilize for war, unless we have a plan to protect the nation during the period of mobilization.

THE BEST INFORMED authorities of our country have affirmed their acceptance of the fact that an adequate Air Force in being is required to maintain the peace and to protect the country in an emergency. In recent months many of our leading citizens have agreed with this view as evidenced by their testimony before the President's Air Policy Commission. In its report "Survival in the Air Age," released 13 January 1948, this commission stated:

"We must assume that if future aggressor nations have learned anything from World Wars I and II, it will be that they must never let the United States industrial power get under way: They must destroy it at the outset if they are to win."

For a period of time during World War II, the attrition rate in heavy bombers in the European Theater was as high as 25 percent each month. If an emergency should come, without adequate plans for replacement airplanes, it might be a matter of just a few months until our Air Force was completely grounded. We know from experience that we can produce 100,000 planes or more per year after four or five years, but in any future emergency, the ability to produce 10,000 to 15,000 planes in a limited number of months after the emergency starts may be the difference between defeat and victory.

If this country is to support the Marshall Plan, maintain world peace, and be prepared for such emergencies as may arise in the foreseeable future, it is imperative that immediate steps be taken to prepare a limited objective or interim logistical and industrial plan providing for the immediate operation of the Air Force *in being*. This must include a detailed program for the production of replacement airplanes, equipment and supplies during the early months of an emergency. This must be superimposed upon, and have priority above, the overall mobilization plan. Without such a plan, we may be unable to defend our country and buy the time necessary to mobilize the resources of our nation to carry on a survival war.

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*It is probable that other nations will develop atomic weapons before they develop supersonic bombers in quantity with a striking range of 5000 miles, or supersonic accurate guided missiles with a 5000-mile range. Nevertheless, it would be unwise to assume, in the planning of our defense establishment, that other nations will not have the planes and missiles capable of delivering a sustained attack on the United States mainland by the end of 1952.*

-- The President's Air Policy Commission  
*Survival in the Air Age,*  
1 January 1948

# THE AIR OFFENSIVE IN OVERALL STRATEGY

*Colonel Cecil E. Combs*

THE PURPOSE of this article is to discuss the relation of a strategic air offensive to overall strategic courses of action. The concept of the strategic air offensive under consideration may be defined as follows: *The strategic air offensive is that offensive which has for its purpose the destruction of the enemy's industrial, economic and other resources upon which his war potential depends.* Its successful accomplishment may be decisive. If not, it becomes a necessary prerequisite to accomplishing the decision by other means.

There are other strategic courses of action such as the surface offensive. The surface offensive may be defined as the air-ground campaign which has for its objectives the seizure and retention of land areas essential to our operations; the denial to the enemy of areas vital to his operations; the ultimate aim of destroying the enemy's armed forces, occupying his vital areas and forcibly imposing the national will upon the enemy people. Also there is the naval offensive, which is that course of action aimed at the destruction of enemy naval forces and the control of essential sea areas. Its purpose is to starve the enemy economy of raw materials and permit further projections of troops into enemy areas. These concepts represent the essential differences between armies, fleets and air forces. In the past, these principles often proved valid as expressions of grand strategy in war. Today they have only limited significance.

It has often been said that military strategy depends upon national policy. In peacetime this is undoubtedly true. It must be recognized, however, that the events of a war in turn exert considerable influence upon the political objectives for which a war is fought. This interrelationship is not dynamic in peacetime and is apt to be overlooked. It is highly important, therefore, that national policy always

retain a certain amount of flexibility. While policy varies, military strategy has one unchanging aspect--*the ultimate objective of war is to overcome the enemy's will to resist.* All other objectives are but means to this end. This end may conceivably be achieved in several different ways, a fact that justifies consideration of the three concepts defined above.

If conquering the enemy's will to resist is the final aim of war, it would appear advisable to determine a more precise definition of this objective. In a strictly realistic sense the will to resist is based on the conviction that the consequences of further resistance will be more desirable than the consequences of ceasing to resist. It is assumed that this desire lies primarily in the minds of a nation's leaders who, of course, are influenced by the resistance of the people and of the armed forces. This relationship depends in part upon the structure of the nation and on its racial, geographic, and economic unity. •

During World War II that particular technical aspect of strategic bombing operations which had to do with the selection of targets received a great amount of study and thought. Sound principles were developed by which production criteria, physical vulnerability, force requirements, and cost estimates could be analyzed in estimating the most desirable courses of action. It is suggested that these same techniques be applied to the enemy's will to resist, that the same target analysis be made to determine the physical objectives, the timing, and the weight of effort required to accomplish the desired end result. Such an analysis must include consideration of the following:

What composes the will to resist?

Upon what moral and physical foundations is it based?

Where does it reside and where is it vulnerable?

What are the symptoms of its deterioration?

What are the ways by which it can be overcome?

Is it always a real entity which *can* be attacked?

What is its relation to factors over which we have some measure of control?

Not all of these factors are capable of exact calculation but all can be at least partially analyzed. Even a casual

consideration would indicate that a very close relation exists between enemy will to resist and our own national policy. An essential element in the will to resist is fear of the consequences of defeat. Once the results of prolonged resistance have been made clear to an enemy nation, its estimate of the consequences of surrender will have a decisive effect upon will to resist.

**I**N THE PAST war our national objectives were negative. The unconditional surrender formula now appears to have been a cloak for a lack of objective aims other than successful termination of war by the complete overthrow of Naziism and Japanese militarism. It was not until this formula was modified by the Potsdam Declaration that the door was opened to the acceptance by the Japanese of the surrender terms. Many serious students have questioned whether Germany might not have surrendered some six months earlier had our war aims been more precisely expressed. When it finally occurred, the capitulation of Germany was not so much a surrender as a complete military and political disintegration. The case of Japan was quite different. Early in 1945 Japan's distress, both economic and political, became apparent. Simultaneously, many persons began to ponder the possible impact of spelling out to the Japanese what we meant by "unconditional surrender." Some felt that a clear explanation of national aims with respect to Japan would permit her leaders to weigh the consequences and reach a rational conclusion. The Potsdam Declaration, which voiced this strategy, was far more significant in effecting the Japanese surrender than the two atomic bombs. (This conviction is borne out by interrogation of Japanese leaders.) The example of Japan would indicate that ideally the political objectives of a war should be such that the way is always left open to a negotiated peace satisfactory to us. Thus, the value of any strategic concept must be analyzed in terms of its adaptability to such a flexible arrangement.

A complete analysis of the factors bearing on the ultimate objective of war has not been made, in theory or in practice. Yet it is only in terms of such considerations that our strategic concepts can be evaluated. The validity

of the concept of the strategic air offensive depends upon the assumption that the enemy's will to resist can be destroyed by demolishing economic, industrial and other resources upon which war potential depends. The concept of the surface offensive assumes that the defeat of the enemy's armed forces can destroy the enemy's will to resist, and that the occupation of his territory will permit the forcible execution of our national policy. The principle of the naval offensive is based on similar assumptions.

It would appear that a "target analysis" of the enemy's will to resist must be made, and vulnerabilities and force requirements determined within fairly accurate limits before one can estimate the degree of assurance that any separate course of action offers. It may be that we have too often thought of these separate strategic concepts as representative of entirely different types of warfare. Armed forces consist of armies, fleets, and air forces. In so far as each service has an independent capability, so far are these concepts applicable to the problems of modern war. There is an obvious danger, however, in thinking of separate concepts. It is difficult to imagine independent naval or land force action. It is at the present time impossible to contemplate independent air action without adequate ground defense of air bases and secure lines of communication. We often fallaciously think of air, ground, and naval campaigns as each having its own peculiar objectives, when, in fact, the ultimate objective is one which may be influenced by any or all of these campaigns. The reverse is also true. The existence or non-existence of the Italian fleet had little to do with Italy's surrender; Japan capitulated but her armies had not been decisively defeated.

The way to avoid these vaguely defined dangers appears to be--first, to develop an overall strategic concept based on our own national policy which recognizes that the sole objective of all military action is to overthrow the enemy's will to resist. Another necessary step is to recognize the interdependence of armies, fleets, and air forces and achieve a balance among lines of action that offer assurance of success while providing guarantees against prolongation or unacceptable termination of the war.

FROM STUDY of its component parts we can define an overall strategic concept as *a plan to destroy by force the enemy's will to resist in order to achieve the objectives of national policy*. There are three elements in this concept. The first is force. It includes economic, political, and psychological as well as armed power. It can be applied by many weapons, from the propaganda leaflet to the atomic bomb. The second is the enemy will to resist, which, as we have seen, is a complex variable that must be analyzed in detail. A third element is our national policy, a program that might vary from merely restoring the status quo to achieving complete physical destruction of an enemy nation.

In their relationship to each other these principles become three complex variables. To express their interrelationship a formula may be employed--first, consider the objectives of national policy; second, estimate the resistance to be overcome; third, determine the force required and its timing based upon our capability. This formula disregards certain vital factors such as the rapid change of objectives of national policy and determination of the force required.

An overall concept of this nature will provide a constant measuring stick by which purposes, objectives, means, and courses of action may be evaluated. However, the extent to which the factors of this concept apply can only be determined by selective analysis.

First, let us consider national policy. At any given time our national policy with respect to a particular nation might involve no more than the termination of normal relations, followed by economic and psychological warfare without actual armed conflict for the purpose, say, of enforcing a voluntary return to a status quo ante. More determined purposes might encompass the forcible retaking of some disputed territory and restoration of it to the former owner. It must be emphasized, however, that any hostile measure short of war involves the risk of total war. War is not easily contained. It breeds its own objectives and nourishes its own passions.

On the other hand, we cannot assume that all future wars are certain to be total. We are apt to think that since the

last two major wars have been more or less global in extent that total war is the rule of the day. We must remember that total wars are not a twentieth century innovation. The Punic wars of the Romans were total by current definitions and achieved the complete destruction of Carthage. Admittedly, such wars were not global in character but the areas involved constituted the whole of the civilized world as it then existed. Present methods of warfare may be more adaptable to the destruction of a nation, but modern civilized morality, such as it is, would not countenance the total extermination of a nationality. This past war has seen our national aims become crystallized toward somewhat more moderate goals than national extermination. Minimum aims might conceivably be no more than such as will secure a reasonable safeguard against future aggression. The severity of a nation's aims are apt to depend primarily upon the magnitude of the issues involved, the fears and emotions generated, and the effort required to achieve victory.

Another factor inherent in the national aims and related to the enemy's will to resist is the consideration expressed in the question, "Is the game worth the candle?" Victory can come at an unacceptably high cost just as defeat can come acceptably low.

**T**HE MILITARY problem is to determine the method and application of the force. Heretofore it has been enough that the military be aware of nonmilitary considerations. It has always been assumed that policy governs strategy and that if policy were not fixed and unchangeable the strategists could not predict its variations. We have already questioned the validity of this assumption.

The overall strategic concept is essentially an offensive one. There are factors which limit its adaptability. One is scarcity of means. In previous wars the United States paid the price of unpreparedness in time lost, although in each instance the required resources were ultimately available in sufficiently overwhelming quantities to insure victory. A basic undertaking in any war is the preservation of one's capacity to wage war. In the next war it appears certain that there will be vastly increased requirements for civil

defense and for the preservation of national unity and productivity under attack. It is fairly certain that the military will not have a blank check and, while we see the necessity for the ultimate offensive, we can predict the clear necessity for husbanding our resources and meeting first things first. In order to win in war it is first necessary to provide for not losing it.

The military planning necessary to our security must be entirely realistic with respect to those limitations on preparedness which our form of government and economy imposes. This realism is most difficult to attain. Part of the problem hinges upon the state of balance that exists in peace. The balance of armed forces that exists now is governed by tradition, by laws that are not easily changed, by public awareness and by resources. Our knowledge of potential enemy capabilities, technical developments and the state of our defenses enables us to estimate the requirement for civil defense. Under certain anticipated conditions of atomic warfare, it will obviously be an enormous one. Even though we may be able to anticipate requirements, we cannot always be assured of meeting such requirements in time. Our mobilization plans in the past have always been piecemeal, partial solutions improvised on the spur of the moment. It is clear that many of the foreseeable problems of the future will require that some radical changes be made. When we start dealing in shortages we must establish priorities. Certain principles will have to be observed:

- (1) The greatest emphasis must be put on those forces which will be first required.
- (2) Economy will govern. The planning of every undertaking must consider the price tag on the project.
- (3) The timing of preparations must be carefully integrated. Certain types of forces take much longer to equip and train than others. It usually happens that these are the forces which are needed earliest.

From a military standpoint the conflict of requirements between offensive and defensive courses of action is easier to solve. The governing principle is not controversial. This problem is determined largely by capabilities and limitations of weapons and forces and, therefore, is capable of a military solution.

THE BALANCE between the strategic air offensive and other necessary courses of action is not so easy to resolve. Alternative joint courses must be selected. In the event one effort fails other means must be employed until the ultimate objective is achieved. In evaluating these joint courses of action certain controlling factors apply.

- (1) Capabilities and limitations of weapons. A naval blockade may be highly effective against an insular power that is dependent upon imports for its existence. Such a course of action would not offer much chance of success against a self-sufficient continental power.
- (2) Certain national policies may require a high degree of selectivity or discrimination in the way in which force is applied. Total methods of mass destruction are only adaptable to total warfare. A strategic air offensive is a total effort not suitable for policing purposes or guerilla tactics.
- (3) The problem of bases. The strategic air offensive requires bases from which to be mounted. The struggle for gaining and retaining such land areas may well involve tremendous air-ground campaigns. Newer aircraft may make strategic Air Power less dependent upon advanced bases, but the increasing requirements of logistics, which make it possible to quadruple the intensity of the effort by halving the range, indicate the necessity for bringing the bomber ever closer to the target.
- (4) The nature of the opposition has a vital bearing on the choice of operations. Strategic Air Power, for example, is most effective against a highly industrialized complex.
- (5) Cost both in time and in resources will have an increasingly important bearing on our selection of courses of action.
- (6) Logistics, as always, is a controlling factor.
- (7) Unpredictable new developments in weapons are apt to cause major diversions of effort.
- (8) The inertia connected with putting large undertakings under way often creates a situation in which future

courses of action are determined by logistic considerations to such a degree that there are no longer alternatives. For example, once the large build-up of men and materials reached sizeable proportions in England, the invasion of the continent was a foregone conclusion. After such an expenditure of preparatory effort had been made it was actually impossible to stop the undertaking.

In the last analysis, *war is still an art*. A certain amount of calculated risk must be taken in selecting courses of action. It is our concern that the calculation shall be carried to the maximum degree of accuracy and that it be based upon sound assumptions. An excellent example of this art in operation was General Marshall's decision early in 1944 to cut out twenty infantry divisions in order to permit expansion of the B-29 program from eight to twenty groups.

**IT IS CERTAIN** that any future war in which this country is involved will see major emphasis placed on the strategic air offensive. In considering the strategic offensive alone there are numerous questions of balance to be heeded, such as: how much effort should be directed toward securing a panic knockout, and is such an attempt feasible without the complete domination of enemy air forces; how much effort can be economically expended to destroy basic resources; how much effort is required to secure victory by attrition; what sequence of objectives will best permit the air battle to be won; how much calculated risk can be taken on the basis of technical superiority?

Perhaps the most urgent of these problems lies in connection with atomic warfare. Since the atomic bomb offers such vastly increased capabilities for the destruction of civilization it requires selective consideration for an evaluation of its effect on military strategy.

Our military policy has two purposes--to prevent war, and to plan and prepare for war in the event that we cannot prevent it. The major objective of our foreign policy is also the security of the country. Since that security may be partly dependent on effective international control of

atomic energy, it would appear that military policy must be integrated with national policy to a higher degree than ever before.

The tremendous concentration of destructive power represented in the small space and weight of atomic bombs makes it possible to maintain in being a significant force that is not conspicuously large and which might exist even in complete secrecy. So long as we alone possess the atomic bomb this force must be recognized as a deterrent to aggression by other powers. When, however, other nations possess atomic bombs a similar capability makes the danger of surprise attacks infinitely greater and the need for timely Intelligence becomes imperative.

The uncertainty that exists regarding use of atomic weapons by foreign nations poses requirements for strategy planning that are of unprecedented difficulty.

Atomic power will be utilized for peaceful purposes. Such commercial utilization will surely develop new military applications. We may minimize the destructiveness of the few bombs that have been used so far, but must certainly predict that atomic energy offers possibilities of creating weapons of such destructiveness that the present type atomic bomb would be a toy by comparison.

The atomic bomb greatly enlarges the capacity of armed forces to destroy the enemy's will to resist. Possible lines of action to this end include the threat of use of atomic power as a part of national policy in pressure politics, the use of atomic power to destroy enemy morale, and the use of atomic power to destroy enemy means to resist. Selection of possible lines of action must be influenced by such considerations as political objectives, the vulnerability of the enemy leaders' will to resist and of the enemy people's will to resist, and the interrelationship of atomic, psychological, political, economic, and conventional weapons.

A basic undertaking in any war is the protection of one's capacity to wage war. The advent of atomic weapons will force tremendous diversion of offensive capacity into defensive necessity. The urgency for defensive commitments might fatally restrict offensive capabilities.

The civil defense problems posed by the reality of potential atomic bomb attacks on this country cannot be solved by the passive defense measures of the past, nor by greater assumption of military responsibility, but will require in effect, total service of all individuals in the nation in time of war. There can be no "business as usual" while the threat of atomic bombs hangs over our heads. Only national organization and national discipline can maintain our war effort in the face of this danger.

The atomic bomb is no respecter of tradition. Although we may possess more atomic bombs than a potential enemy we may have to absorb punishment before we can inflict it. As a result we shall be forced into an integrated community of interest in which there are no separate concepts or distinctions. Continuing study of these problems must be aimed at the long term objective. With this common understanding it should also be easier to achieve workable solutions of short term problems such as those concerning immediate technical decisions and modifications of present equipment. Above all, however, we must recognize that here is no gradual evolution in the art of warfare. Here is a change as momentous as the discovery of fire but with more terrible implications. Like fire, this thing must be mastered or it can overthrow us.

These observations on atomic warfare do not change strategic concepts. The problem of implementing our concepts is, however made vastly more difficult and more urgent. There are no longer any strictly military aspects of overall strategy.

In conclusion, it is apparent that the factors which must be considered in planning and undertaking an overall strategic program have become extremely complex. This article has attempted to point out several of these factors with an emphasis on those pertaining primarily to Air Power. In the final analysis, only open-minded receptiveness and constant exchange of thought can provide a clear comprehension of the nature of modern war and the strategic requirements for the security of the United States.

# ECONOMIC PRESSURES

*Thomas C. Blaisdell*

**E**CONOMIC PRESSURES for the attainment of national objectives are nothing new. During the second World War, however, they were refined and integrated with total national policy to obtain the immediate objectives of the war. Even in colonial days close relationship between economic objectives and military action was well known. As pioneers pushed westward from the Atlantic seaboard, the constant struggle between them and the various Indian tribes was often backed up with military force, and the early militias were recruited from these frontiersmen who were soldiers one day and farmers the next. Likewise in the business field the distinction between a naval vessel and a commercial ship was hard to define. Privateers were little more than private merchant vessels acting in the role of naval auxiliaries. It was always difficult to tell which was the one carrying out the national objective--the naval vessel or the commercial ship. It is still difficult. Even during the last war the arming of merchant vessels was an important part of the total military operation.

In order to sharpen our concept of economic pressure we need to distinguish between the legitimate commercial activities of private traders and the economic activities directed by the government in order to achieve a broader objective. When we define economic pressures this way, the problem under consideration becomes clearer.

After the first World War the reestablishment of the economy of Western Europe became a pressing problem. The countries of Western Europe were subjected to tremendous strains which were particularly reflected in the monetary troubles of France and Germany. Runaway inflation plagued these countries during the twenties. The stabilization of their currencies was achieved by major internal reforms combined with loans from abroad. As the countries became stronger, various new governmental activities were developed

to carry out national policies. This was most clearly illustrated in the case of Germany which used all the powers of the state to establish itself as a dominant world power. Never before in peacetime was there such a calculated plan for economic domination as that developed by Germany. By comparison, the establishment of the British Empire was almost an accident of history. To be sure the Crown supported the activities of its subjects throughout the Commonwealth. The place of the British Navy as the connecting link in this great commercial empire cannot be forgotten, but for conscious governmental policy the German attempt has never been surpassed.

This policy called for the use of a variety of instruments. Among them were direct and indirect subsidies for the development of export industries, manipulation of currencies including the establishment of multiple exchange rates for different commodities, quantitative controls over exports and imports, the utilization of official government missions abroad for purposes of so-called penetration and domination, and the carrying out of detailed government programs for the securing of strategic resources. This planned military economy in Germany became particularly dangerous with the rise of National Socialism as a philosophy of world domination.

So similar were the activities of this period to the economic pressures of real war that up to the German occupation of France it was difficult to tell just what being at war meant. Those who had watched the prewar activities of Germany could distinguish very little difference between this early period of war and the years immediately preceding it. The only difference was that there had been some troop movements. Finally came the full-fledged wartime activities with the formalization of war against France and England and then a period of stabilization until the Battle of Britain.

It was during World War II that the utilization of economic pressure in itself was developed to its fullest extent. The outbreak of war in 1939 and the subsequent conduct of hostilities brought about a complete change in our economic pressures and objectives, together with a realization, at home and abroad, of the tremendous economic potential of

this country. Between 1939 and 1945 our economic objectives were directed toward winning the war and laying the foundations for a durable peace and reciprocal world prosperity.

**F**OLLOWING A PERIOD when we shipped scrap and petroleum to a potential enemy, Japan, we embarked on our "Arsenal of Democracy" program. This program was marked by the organization of export control and Lend-Lease. After Pearl Harbor programs of economic warfare and war mobilization were developed and added.

In the fall of 1940 the Office of the Administrator of Export Control was established under General Maxwell. At first few commodities for export were controlled by license. But gradually the list grew, and the manifest of raw materials and supplies requiring export licenses was tremendous. The object of these restrictions was to insure the availability of goods essential to us and to our democratic allies, and to prevent them from passing into the hands of the enemy. This agency also developed the plans for full-scale economic warfare.

In September 1941, when our entry into the war appeared imminent, the Economic Defense Board was established. This agency took over control and extended planning for economic warfare. After December 7, 1941, the Economic Defense Board became the Board of Economic Warfare.

The Board of Economic Warfare conducted its program on several fronts. In the first place, it collaborated with the British Ministry of Economic Warfare in a blockade of the European Axis. The British Ministry already had a full-scale program under way. Our own Board of Economic Warfare was responsible, in cooperation with the British, for an important supply program, the purchase of existing supplies, and the development of new sources of supply of critical materials. It attempted to deprive the Axis of strategic supplies, available principally in Spain, Portugal and Turkey, through a program of preclusive or preemptive purchasing. It developed financial warfare and safe-haven programs in collaboration with the State and Treasury Departments. And it continued and enlarged its original program of export control.

The blockade of the European Axis represents a modification of the former "polite" blockade practiced during the Napoleonic wars. Under the old blockade doctrine, neutrals were conceded certain rights. This was necessary, for frequently the neutrals themselves were strong powers. In World War II the rights of neutrals were whittled down because they were in no position to assert their rights and because the belligerent powers on both sides wished to use them as listening posts, as intermediaries and as supply sources.

To utilize the Allied naval strength effectively, paper controls were used to supplement the conventional naval blockade. The teeth of this "paper blockade" were the navicert and the ship's warrant. All vessels clearing neutral ports were obliged to secure a navicert in order to obtain safe passage to other neutral ports and no ships could purchase port facilities, repairs, or bunkers (fuel) without a ship's warrant. Through the use of these two instruments the Allied powers saw to it that a minimum of strategic materials reached the Axis. Of course, this device could not be effectively applied against Japan until naval and air superiority were established.

**N**ONE OF THE Allied Nations were self-sufficient in all the required critical and strategic commodities. Severe shortages developed in rubber, cinchona and other drugs, mica, industrial diamonds, certain timbers and tungsten, etc. At the outbreak of the war, the Ministry of Economic Warfare and the Board of Economic Warfare conducted large purchasing operations in Latin America, Spain, Portugal and Turkey.

In Latin America the program included not only the purchase of existing supplies but the development of rubber plantations, the equipment, development and exploitation of mines, and extensive forestry operations. All of the supplies obtained in this manner were directed to the Allied war effort and none were available to the Axis powers.

On the Continent, Germany needed, among other things, essential supplies of wolfram, skins, sardines, woolen goods, mica, strontium, mercury, cooper, textiles, oils and fats, and opium. While the Allies did not have a critical need for

all of these commodities, a program called the preclusive buying or preemptive purchase program was instituted to buy up all the available supplies of these materials to prevent them from falling into enemy hands. Although preclusive purchasing was not as successful as its proponents had hoped, it did reduce the flow of these materials to the Axis, enormously increased the price of the supplies which Germany was able to obtain, and forced an inefficient employment of critically short German manpower.

The techniques of export control further permitted the employment of the black list against persons known to be supplying goods to the enemy. Those individuals received immediate discriminatory treatment, being prevented from entering into foreign trade transactions with the Allies. The devices of export control also permitted this country to control the end uses for which her products were destined and to program exports on the basis of minimum essential requirements. Export control not only served to conserve our own supplies of goods but formed an integral part of our program of maintaining a minimum economy in neutral countries and assisted in carrying out the objectives of the blockade.

Before we were strong enough to match Germany's military force in Europe, we possessed two economic weapons that helped us offset her fighting strength. These weapons were the dollar and the pound sterling. Our joint financial superiority enabled us to outbid the Germans for materiel. Our institutions in the banking and insurance fields assisted in establishing and maintaining our control over shipping and cargoes. We purchased abroad large quantities of materials needed for the prosecution of the war. Through these purchases we were able to consolidate our economic strength in Latin America, Africa, the Middle East and the Far East. We dominated the market for scarce materials so completely that we were able through the combined boards to control their distribution to both Allies and neutrals.

**O**UR FINANCIAL WARFARE program against the Axis had four principal purposes. First, we tried to prevent the Nazis from using the economic resources they had accumulated in conquered territories. Secondly, we attempted to break

up the Axis control over foreign business, cutting the ties between subsidiaries and affiliates of European firms in the Middle East, Africa and Latin America. In the third place, we tried to make it as difficult as possible for people outside of Axis territory to collaborate with our enemies. Finally, as the tide of war turned more and more in our favor, we attempted to forestall the enemy's effort to transfer and conceal assets abroad for use after defeat. This was called the Safehaven Program.

The methods we employed included the discovery of "cloaks" acting as financial dummies for German interests, the freezing of enemy and neutral assets in this country, and a program of financial neutralization carried out by the Treasury Foreign Funds Control. All financial transactions were licensed by the Treasury and only those innocent of enemy taint were permitted. Strict control was maintained over the export and import of securities and currencies to prevent looted valuables from being sold, and to reduce the amount the Germans might obtain for them in foreign markets. The wide use of the dollar and pound sterling in international transactions helped make these controls effective.

Toward the end of the war it became evident that Germany was making preparation for a third World War. These preparations included plans for an underground Nazi movement and the placing abroad, in dummy concerns and cloaks, of the proceeds of Europe's looted assets. Large amounts of securities, currencies, and goods were sold abroad and left for safekeeping in Switzerland, Spain, Portugal, Sweden and Turkey. This Safehaven program of economic warfare had limited success. Since the looted property was in neutral countries and subject to the laws of these countries, our claims to it and control over it were limited. We did conclude agreements with Sweden and Switzerland whereby some of the looted capital is to remain their property and the balance is to be returned to the Allies.

Perhaps the most important economic weapon of World War I was the institution of Lend-Lease. Of the many shortages in the wartorn world, the scarcity of dollars and dollar assets was the most severe. Had our Allies been obliged to pay cash for all of the military and civilian equipment

which they required, they would have emerged totally bankrupt and in an even worse condition than they are now.

The Lend-Lease program provided for supply of a very wide variety of goods for our Allies and neutrals without any immediate payment. These goods were designed not only for the immediate prosecution of the war but for the support of civilian populations and for the prevention of disease and unrest.

Up to July 1, 1945 we furnished a total of more than \$42 billion worth of Lend-Lease materials. Munitions accounted for 49% of this total, petroleum for 5%, industrial materials and products 20%, agricultural products 14%, while shipping and other services made up the balance of approximately 12%. Forty-two percent of our Lend-Lease goods were sent to the United Kingdom. The U.S.S.R. ranked second with 28% of the total shipments. Thirteen percent went to Africa and the Mediterranean area and 12% to the Pacific and Asiatic regions. We received about \$5½ billion worth of reverse Lend-Lease, principally in the form of capital installations, petroleum and coal products, shipping, military supplies and equipment. The role which Lend-Lease played in the ultimate victory can hardly be overestimated.

**A**N IMPORTANT FORM of wartime economic pressure is illustrated by the Allied Middle East Supply Center program during the war. Until the defeat of Rommel, the danger of the eastern and western Axes joining forces through the Middle East and the Suez Canal was acute. After his defeat, it was necessary to preserve our blockade in these areas and to provide a minimum economic standard for the countries of the region.

The Middle East Supply Center was established in April 1941 under British control and in the spring of 1942 the United States joined the partnership. This Center programmed the requirements of the several countries, issued import and export licenses to control the trade of the area, procured and distributed essential supplies, and accumulated stockpiles. To save valuable shipping space and short supplies, the Middle East Supply Center assisted in the development of local production and increased the intra-regional trade of

the countries. Through the work of this agency the neutrality of the area was guaranteed and was closed as a source of supply to the Axis.

Lend-Lease, blockade, export control, and financial pressures served their purposes during the war. All were directed towards winning the war. Some of them such as Lend-Lease served to strengthen the Allies; others primarily weakened the enemy. But broad concepts such as strengthening friends and weakening enemies cannot be readily applied during the present period when objectives cannot be as clear as they were during the war. The distinction between friend and enemy is not as sharp. Even the objectives of freedom and free institutions are general in character and are subject to varying interpretations. Thus, the use of economic pressures for the attainment of national objectives becomes much more difficult than during wartime. At present, our principal use of economic pressures is of a positive and constructive character, with the objective of maintaining friendly relations and strengthening free societies. We are not carrying our pressures to the extent of discriminating commercially against those who do not accept our ideals. One could predict what might happen in the future as a result of discriminatory action against certain countries. Let it suffice here to merely state the fact. Keeping this possibility in mind, let us consider the economic methods we are using to build and maintain the friendship of nations.

Since the war, the United States has continued to supply financial aid to other countries in large volume. The total is about \$15½ billion. This sum is composed of *grants* of approximately \$4.7 billion, including Lend-Lease credits, relief and rehabilitation as well as dollar grants. It includes *credits* of approximately \$4.5 billion for the purchase of Lend-Lease and surplus property, commodity programs and dollar disbursements on loans. An additional \$3.4 billion comprises payments for goods and services to military personnel and for special currency purposes. Payments on account, of subscriptions and membership in the International Monetary Fund and International Bank, of \$3 billion make up the balance. Against this total must be set a sum of \$2.4 billion consisting of receipts on account of

repayments on loans and credits, Lend-Lease cash receipts and surplus property cash sales.

In addition to the lending program, aid has been extended in the form of UNRRA and post-UNRRA relief and rehabilitation, foreign procurement activities, Lend-Lease and surplus property credits, the economic rehabilitation of occupied areas, payment for military and other installations, and ship sales.

**B**ESIDES THIS direct assistance we have chosen to work through a series of international agencies in order to make our strength felt most effectively. This idea of mutuality and cooperative action is as important today as during the war. No one enjoys being helped. The recipient tends to react against the giver unless the spirit of mutuality dominates the action.

The first of these international agencies was UNRRA, which has now passed into history. The others include the International Monetary Fund, the International Bank, and the International Trade Organization.

There are many reasons why UNRRA's success as a relief agency was limited. It was the first time such a large-scale operation had been tried. There was lack of clarity as to the scope of UNRRA. The distinction between those countries to receive direct aid, such as the countries of Western Europe, and those to receive aid through UNRRA, primarily Eastern Europe and the Far East, made for ill feeling. The employment of UNRRA aid as a political tool caused repercussions in Eastern Europe. The end result, for these and other reasons, was the breakup of the organization.

The second agency, the International Monetary Fund, was designed to eliminate the currency and exchange handicaps which obstructed foreign trade. These encumbrances included unpredictable shifts in rates of exchange, multiple rates of exchange, wholesale abandonment of the gold standard, and the unpredictable lowering of the gold content of standard monies--all devices used during the 1920's and 1930's as instruments of aggressive economic action.

The International Monetary Fund can help bring many of these difficulties to an end. It is designed to make short-term loans, thus preventing temporary shortages of currency from hindering the purchase of goods abroad. Any member country can borrow limited amounts from the Fund.

While the elimination of undesirable currency and exchange practices will prove of value in restoring world trade, it will not greatly assist the nations of the world in the rehabilitation of their economies. The International Bank for Reconstruction and Development was planned, in part, to accomplish this end.

Before the existence of the Bank, international borrowers went direct to the international investment bankers for their funds. One of the great criticisms of this system of private financing has always been that it resulted in stipulations that came to be regarded as onerous, and which governments later were called upon to support--sometimes with troops. The conflicts and economic pressures which resulted from this system have long been regarded as among the causes which lead eventually to war. The Bank was designed in part to provide a cushion for minimizing such pressures and to establish a forum in which the major economic conflicts could be ironed out.

Another important reason for establishing the Bank at this time was based on the premise that government credit would be superior to private financing during the period immediately following the war. It should be noted that the Bank will not make loans for the financing of projects unless it is necessary to secure capital abroad for those projects. It has an authorized capital of \$10 billion, much of which has already been subscribed. It can make loans to any member nation and to any business, industrial, or agricultural enterprise in the territories of a member. In so doing, it can also raise funds through the sale of its own securities.

Just as the Fund and the Bank were designed to reduce economic conflicts between countries, the International Trade Organization was planned to prevent the use of government pressures in support of economic objectives and to encourage the competitive activities of private traders.

**D**URING THE DEPRESSION of the thirties, the nations of the world sought to increase their export trade and decrease their imports in an effort to provide employment and to raise living and production standards. This led to the large-scale development of many restrictive trade practices including those carried out by governments and by private combines and cartels.

Increase in customs duties and tariffs, together with tariff preferences granted certain countries, were among the most elementary of these restrictions. Other devices included quota arrangements which reduced the quantities of goods imported or exported; embargoes which forbade exports and imports entirely; subsidies granted to stimulate the production or export of particular commodities; the control and licensing of foreign exchange; and state trading. The ITO charter was drawn to minimize the use of these pressures by any one country on any other.

The International Trade Organization and the other world-embracing institutions mentioned here were based in large part on the theory of the diffusion of economic pressures to prevent the clash of national interests. They assumed that the postwar world would more nearly approximate the prewar world than has turned out to be the fact. The assumption that the many institutions of Europe would again begin to function once fighting stopped turned out to be only partly true. Governments were weak and the peoples were divided among themselves. We might say that while we were trying to achieve the diffusion of economic power, we succeeded too well; actually economic power must be organized if it is to be channeled. The conflicting forces have produced so much weakness that the very institutions which were organized to build constructively have not been able to function. This has necessitated replanning and reconsideration of America's use of her economic strength. It has resulted in what is commonly known as the "Marshall Approach."

Quite briefly, General Marshall proposed to the Western European countries that the United States would work with them in the development of a coordinated and integrated European economy in which the free institutions with which we are familiar would continue to flourish. This proposal

embodied the conscious use of our economic pressure in its most constructive form. It clarified our own objectives as far as Europe was concerned. It applied the rule that offense was the best defense. It recognized the mutuality of our own problems with those of the countries of Western Europe.

Representatives of the sixteen countries of Western Europe spent the summer of 1947 in Paris formulating a report of European economic cooperation which was submitted to the United States government last September. The broad character of this program is a notable achievement. It estimated that \$20 billion, covering a four or five year period, would be required from this country to erect a workable economy in Western Europe. It also recognized the necessity for vigorous steps by each of the participating nations in order to achieve financial and monetary stability. It is in no way a complete blueprint for the new Europe, but is a long step forward in the integration of the peace program of the participating nations.

In summary it is apparent that economic pressures can be direct instruments in fighting a war and that they can be used in peacetime for constructive as well as for destructive purposes. Also, that particularly during peacetime it is difficult to sharpen the objectives toward which governments apply their economic strength. Economic pressures are powerful weapons which at times may become necessary instruments of national policy.



*World War III . . . will originate with a dictator-ruled country. It will be preceded by extensive espionage and by propaganda stressing the aggressor's good intentions and desire for international cooperation. There will be no diplomatic warning and no small-scale aggressions as a preliminary. The first victim will be the continent of North America. If the United States is strong and alert, no cities will be damaged. The initial targets will all be fortresses on land, warships at sea, and our island outposts. But if the United States is weak, every community with a population of 5000 or more will be pulverized.*

-- William Liscum Borden  
*There Will Be No Time (1946)*

# TACTICAL AIR POWER

*Lieutenant General E. R. Quesada*

PRIOR TO the outbreak of World War II, Tactical Air Power was virtually an unknown factor in the armed forces. Before then, various members of the services had advanced vague assertions and generalities on the role and employment of Air Power in conjunction with land and amphibious operations, but none of these ideas were ever developed into a concrete doctrine for actual application in waging war. Perhaps a lack of appreciation of the potentialities of this new force contributed to the absence of a sound universal concept for its employment. To be sure, weapons were emerging with characteristics suitable for this embryonic force, yet tactics for their employment were never developed.

This was the condition of Tactical Air Power on the eve of the greatest conflagration of all times. The complete lack of a concrete concept was conducive to a hysterical acceptance of the doctrines employed by the German Air Force. As a result of the decisive victories of the German Army in Poland, France, and the Lowlands, some members of our armed forces became very outspoken on the precepts of Tactical Air Power as portrayed in these campaigns, and actively urged our adoption of their principles. Fortunately, the inherent fallacies of the German concept were finally recognized and rejected.

Briefly, the Nazi idea of Tactical Air Power conceived this fighting force as an organic component of a surface force. This military strength was exploited and controlled as an additional means of augmenting the firepower of the specific surface unit to which it was assigned. Instead of utilizing this force en masse when the situation directed, each component of the surface force was augmented with a small air force subject to the direction and desire of that particular commander. The end result of this fundamental misapplication of Tactical Air Power invited defeat in detail, although in the early days of the war it appeared to

be the most effective manner for accelerating a surface campaign. Numerous examples substantiated this conclusion. However, as the war progressed, evidence accumulated that seriously questioned the validity of this conclusion. Tactical Air Power, employed as an organic component of the ground force, degenerated into a specialized attack against immediate objectives without consideration of the overall objective of the entire surface force. This resulted in enhancing the movement of a few surface force elements, but did not accomplish the acceleration of the surface force in its entirety. Also, it frustrated a concerted action by all elements of the force involved. An example of this precept of employment occurred in the North African campaign in which the Luftwaffe was committed to direct support of its ground force with complete disregard for isolating and interdicting the area of immediate contact. As a result, the allied armies were able to accumulate the necessary materiel to support an all-out effort at a later date. The German Air Force became involved in a sporadic, day-to-day support of local surface action, disregarding the potential threat in the rear area. This ultimately resulted in a complete collapse of German military forces in this section.

In addition to this mistake, the German concept failed to recognize that general or local air superiority must be achieved before a major campaign can be pursued without serious loss or complete disaster. The disregard of this fundamental was readily evidenced in the Battle of Britain. In this operation, which aimed at the destruction of the means of waging war, the German Air Force found itself possessing weapons designed to support a surface campaign and feebly unprepared to engage in a war for domination of the air. Further, the German scheme of maneuver revealed a complete lack of appreciation of the fundamentals of war as applied to an air campaign in its entirety. The consequence of this contempt of the fundamentals of war permitted a defeat in detail. It must be recognized that German Air Power, properly employed, might have defeated the RAF by mass alone. However, this conclusion cannot be completely substantiated on the evidence available.

From the above discussion of the concept of Tactical Air Power as conceived by the German armed forces, the violation of certain principles of war is readily evident. Most obvious was the violation of the principle of mass. Time and again this lack of concentration of effort resulted in the ability of the opposing force to counter the attack. Thus, the German commanders unconsciously permitted their Air Force to degenerate into an impotent factor. Another unmistakable fallacy in their concept was the inability to project the role of Tactical Air Power beyond those immediate objectives confronting the surface forces. This lack of imagination resulted in the construction of a stereotyped air weapon for a particular task with no inherent flexibility. This culminated in an unbalanced force incapable of sustaining itself against an adversary equipped with weapons capable of attaining control of the air. Consequently, with the loss of air superiority, the Germans lost the primary weapon designed to enhance the chances of ground success.

**T**HE JAPANESE concept of Tactical Air Power was much sounder than the results would indicate. Apparently from studies of phases of the European war, especially the Battle of Britain, they recognized the paramount importance of air superiority or counter air operations before committing Tactical Air Power to any other action in support of surface campaigns. However, despite the soundness of these principles, the method of adhering to this fundamental laid bare the great deficiency in the Japanese utilization of Tactical Air Power.

The employment of Tactical Air Power by the Japanese was in many respects startling in that they consistently displayed a lack of estimation and proper evaluation of the situation which inevitably resulted in misapplication of the major effort. They misdirected Tactical Air Power to the defense of targets of relatively low strategic significance. This led to a major dissipation of effort that permitted the United States Army and Naval Air Forces to inflict destruction by defeat in detail. Thus, the primary fallacy in the Japanese employment was not in the concept but in the application of that concept. They violated the fundamentals of

war which are common to any military action. The misapplication of mass, improper estimation of the worth of a situation, and the lack of appreciation of the all-important time element were all evident in the Japanese employment of Tactical Air Power.

The foregoing is a rather detailed analysis of the fallacies in the concept of Tactical Air Power as expounded by our enemies. The antithesis of the German doctrines were those principles promulgated by the RAF.

The RAF had to provide air support for British ground forces in Africa. Digesting the tremendous lessons learned from the Battle of Britain, they constructed their philosophy on the foundation of air supremacy. They advanced the theory that air superiority must be established and maintained before a major ground campaign may be launched with reasonable assurance of success. This tenet further dictated that Tactical Air Power should constitute a separate and distinct force, coequal but independent of the surface force. The last portion of this doctrine envisaged direct support in the immediate area of contact as prescribed in the German theory. Thus, we see the evolution of an entirely new and different doctrine, evolved under stress and trials, that permitted greater exploitation of Tactical Air Power than previously achieved. This precept of operation provided a logical and firm basis for the construction of our own philosophy of air-surface operations.

**O**UR ENTRY in the North African campaign afforded us the first real opportunity for a detailed examination and analysis of this precept. It soon became evident that our own forces were pursuing the same fallacious paths as had the Nazi Air Force. A condition was rapidly resolving that was conducive to defeat in detail. In addition, we were committing Tactical Air Power in direct support of the surface campaign before attaining local or general air supremacy. These conspicuous errors of logic nearly resulted in a catastrophe for our meager force, both air and ground, during this early phase.

Fortunately, action was taken to rectify this condition. With the onset of the Italian campaign, our concept of Tactical Air Power embraced the following salient features:

(1) The coequality of air and surface forces.

(2) The attainment of local or general air supremacy as a prerequisite for a major surface campaign.

(3) The direct support of surface forces in the immediate zone of contact.

As can readily be seen, the theory of employment of Tactical Air Power in an interdiction and an isolation campaign had not been tested in battle. The Italian campaign provided an opportunity for the test. To be sure, this doctrine of employment was new and many errors in planning and execution were discernible. However, its employment in Italy emphasized the potentiality of this type of operation, and provided a basic formula for the conduct of future campaigns. It further emphasized the necessity for combined staff planning and close coordination and cooperation between the air and surface commanders in the execution of their respective missions.

For example, in the conduct of an isolation campaign, the surface forces must maintain continuous pressure against opposing units in order that the enemy's means of waging conflict will be depleted faster than they can be replenished. The effect of this action is accelerated until the interdiction program effectively prevents the movement of supplies and reinforcements into the affected area. In the European operations that followed, the isolation and interdiction campaign became one of the most potent factors in the effectiveness of Tactical Air Power.

It is interesting to note that the same results were achieved in the Pacific against the Japanese. Concurrent interdiction of shipping by Naval air and sub-surface forces and the Army Air Forces effectively prevented supplies from flowing in sufficient quantity to many critical areas vital to success of the Japanese war plans.

On the eve of our continental European invasion, a complete concept of Tactical Air Power was an actuality, soundly based on experience gleaned from previous campaigns and training exercises. The aspects of this doctrine were similar to those recognized at the start of the Italian campaign,

with an additional feature: The interdiction of a hostile zone and the prevention of the free movement of the enemy into and out of the selected area of contact.

The refinement and perfection of this doctrine reached its zenith with the crumbling of the Reich. The air-surface team truly became a formidable combination of forces on the field of battle.

The final victory is, in itself, sufficient evidence that our tenets of Tactical Air Power were superior to those of our adversaries. This is not to imply or to be construed that our principles were infallible. If the enemy's scheme of employment had been as decisive as ours, serious defects in our own doctrine might have been readily evident. It is exceedingly difficult to analyze objectively mistakes committed by the victor. On the other hand, errors by the vanquished are easily seen when exposed to a thorough examination.

Thus, we see the evolution of our concept of the role of Tactical Air Power from the beginning to the end of the recent war. We began with an almost complete vacuum and ended with a concrete, highly developed doctrine that produced a complex, but efficient team of air and ground forces. Now let us look at the tactical air organization in operation today.

**T**HE TACTICAL AIR COMMAND is the component of the United States Air Force specifically trained and equipped to participate in combined air-surface operations. It must be remembered that this mission, in the final analysis, is a United States Air Force function, delegated to the Tactical Air Command for implementation.

Today, the Tactical Air Command is the primary agency cooperating with the Army in the furtherance of air-land teamwork. To facilitate close coordination between the two commands, Tactical Air Command headquarters was established at Langley Air Force Base, Virginia, adjacent to Army Ground Force headquarters at Fort Monroe.

In time of peace, as in war, a tactical air command is the air counterpart of an army group. If a new army group is

created, it is necessary to create a tactical air command to work in conjunction with it. This coequality of command was established during the last war and is presently the type of organization being standardized in air-ground operations. In brief, air and ground forces are a team and must work for the mutual assistance of each other. Only through this close kinship can each accomplish its assigned mission in the most expeditious manner.

The major subordinate organization under a tactical air command is a tactical air force. A numbered tactical air force is specifically organized to operate in conjunction with a numbered army or a corresponding naval force or amphibious unit. This is not to imply that a tactical air force is solely a supporting arm, or that it is concerned primarily with direct support of the Army. Rather, it functions as a separate entity and its operations may actually take the form of indirect assault without immediate results. The acceleration of the ground campaign may best be accomplished through the attainment and exploitation of air superiority, thus enabling ground troops to maneuver and attack without interference. Destruction by air of enemy logistical centers and lines of communication materially aids the ground advance.

The Tactical Air Command existing in the Zone of the Interior today consists of two Tactical Air Forces, the Ninth and the Twelfth. The latter operates in conjunction with the armies in the western portion of the United States and is capable of self-sustained action commensurate with the force requirements. The Ninth Air Force accomplishes the same function with respect to the eastern part of the United States.

The core of all tactical air operations is concentrated in the tactical control group. This group is the primary unit through which both offensive and defensive control are exercised. During the war the tactical control group demonstrated its utility by the regularity with which it controlled and placed aircraft over specific points at designated times. This ability contributed immeasurably to the conservation of aircraft and crews as well as personnel and

equipment. In addition, under adverse weather conditions, the tactical control group was the primary attacking agency against objectives in the battle area. Through the utilization of close control radar, bombs were automatically dropped by computing the bombing problem in the radar control center. Certain features of the system were not all that was desired, but it did indicate the channel of development that must be pursued in the future.

We in the Tactical Air Command have accepted the concept of Tactical Air Power and the relationship of the air-surface force team, as it existed at the cessation of hostilities, as a point of departure for future cogitation and thought. With these precepts as a generating force, some very nebulous ideas are beginning to emerge with respect to our future doctrine. It is axiomatic that supremacy or control of the air is a prerequisite to a successful major campaign. This principle is valid regardless of whether a remotely controlled missile or a conventionally controlled aircraft is used. Security from air attack of any kind is extremely important to a surface force, since it permits the most advantageous location of logistical centers, the movement of forces in conformance with the tactical situation, and concentration of forces without fear of observation and sustained attacks.

**T**HE INHERENT ability of Tactical Air Power to be a decisive force in a strangulation campaign is evidenced by the complete disruption of the lines of communication in greater Germany. It can be stated without reservation that this portion of our concept potentially affords the greatest return. The past conflict has only superficially indicated the full import of this method of operation. One of the major roles of Tactical Air Power in a future conflict may be the prevention of a hostile force from engaging in a battle with our surface forces. Our proved doctrine envisaged the isolation of a hostile force from its means of support or from joining engaged units, but did not encompass the prevention of an enemy force from initially engaging in battle. If the surface forces can be delayed or prevented from making contact, the strategical striking force will be provided

additional time and support to destroy the morale and industrial and physical facilities essential to hostile power. Since our industrial potential may not be capable of simultaneously supporting a strategic and a surface campaign, a very careful analysis must be accomplished in order to determine the most effective and least costly method of concluding a war. It may be desirable to prevent opposing armies from coming into contact and at the same time securing those areas necessary for continued offensive operations.

It appears on the surface that it is far more efficient and economical, both in human and monetary values, to paralyze the enemy's means of communication, sources of industrial support and the ability to commit to combat, rather than to engage in a long drawn-out surface campaign. If the enemy's methods and means of waging conflict can be seriously compromised, it is relatively unimportant and unnecessary to physically destroy his military forces. The final objective is to subdue the will of the adversary with a minimum of expenditure in personnel and equipment and, if possible, prior to the time the surface forces collide.

If the surface forces become engaged, Tactical Air Power, in conjunction with strategic Air Power, will be mustered in an all-out effort to effect a decision. If the concept of Tactical Air Power, as already stated, is effectively pursued in a future conflict, direct support in the zone of contact may constitute a small portion of the total effort. If Tactical Air Power does not perform its function in a convincing manner, the fact will be evidenced by requests for direct support. But, as long as surface forces constitute a major element on the field of battle, Tactical Air Power must be prepared and equipped to provide maximum assistance in the prosecution of this campaign.

The next conflict may so completely exhaust the natural and industrial resources of a country that the victor is also the vanquished. Therefore, we must determine now how we can best provide this country with the security it so justly deserves at a minimum sacrifice of life and materiel.

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# AIR RAMMING TACTICS

*Major John J. Driscoll*

*The quick falling cherry blossom,  
That lives but a day and dies with destiny unfulfilled,  
Is the brave spirit of Samurai youth  
Always ready, his fresh young strength  
To offer to his Lord.*

Translation of an ancient Japanese poem.\*

AIR RAMMING TACTICS, though today synonymous with *Kamikaze*, did not originate with the Japanese Air Forces or the *Luftwaffe*, nor were such tactics limited to World War II. On the contrary, the earliest record of unquestionably deliberate ramming, and the first recorded aerial combat, occurred in 1914 when a Russian observation plane rammed a similar type German aircraft.<sup>1</sup> The recommendation for ramming tactics as a final recourse may be found in an American treatise on air warfare published in 1926.<sup>2</sup> The theory was advanced that if the fire action of pursuit planes does not bring down the bombers, then, to quote an early U.S. Air Service instructor in tactics, "There remains one other recourse for the attacking pursuit: deliberately to ram each and every bomber."<sup>3</sup> This same line of reasoning was used by the *Luftwaffe* in its rammings against the 8th Air Force B-17s and B-24s over northwestern Germany.

The Japanese Army Air Forces likewise visualized some degree of success in conceiving their "body-crash" tactics against the B-29s.<sup>4</sup> (See Figure 1.) What will be the effect

\* From the traditional Japanese cherry blossom was chosen the symbol of *Samurai* spirit--"willingness to die young and vigorous, rather than to live and fade." The uniforms of the Japanese Army and Navy for years have carried conventional cherry blossoms on the badges. And based on this same tradition the name *Sakura* (cherry blossom) was adopted as the official Japanese nomenclature for the suicide bomb.

<sup>1</sup> *America's Munitions 1917-1918*. Report of the Assistant Secretary of War, 1919. Gov't. Printing Office, Washington, D. C.

<sup>2</sup> Sherman, William C., *Air Warfare*, 1926, Ronald Press, New York.

<sup>3</sup> *Ibid.*

<sup>4</sup> *Reference Manual on Body-Crash Attacks Against B-29s*. Hqs., Japanese Air General Army, Tokyo, April 1945.

of modern technology upon the future tactical employment of rammers? Do remotely controlled missiles by-pass the utility of such tactics, or might the piloted missile be effectively employed as an air defense weapon?

Public criticism of the *Kamikaze* pilot was very prevalent in the United States throughout World War II. The patriotic Japanese was branded a "suicide" pilot. Allied intelligence agencies nicknamed the Japanese Naval Air Force's specialized *Sakura* ramming aircraft as *Baka* (Japanese for "fool"), despite the fact that in the 1920's it was also accepted U.S. Naval doctrine that ramming "must be resorted to" when conventional attacks failed.<sup>5</sup> To the professional Japanese airmen *Kamikaze* was never synonymous with "suicide," for according to the Bushido (code of the Feudal Warrior) such a death was glorious and assured the individual of a place in the Japanese Valhalla. Nevertheless, records uncovered by the writer at Japanese Army Air Force Headquarters in Tokyo show that despite this concept some pilots accidentally escaped by parachute *after* colliding.

Contrary to most published opinions, the aerial rammings of World War II paid big dividends to the attackers; and it is important to remember that these dividends were paid (to both Germany and Japan) during the *experimental development stages*, and with *orthodox non-specialized aircraft employing haphazard tactics*. An examination of early Japanese employment of rammings against B-29s shows a tally of Japanese casualties to be eleven airmen and sixteen fighter aircraft lost, as opposed to an American loss of forty airmen and four B-29s.<sup>6</sup> B-29 rammings were generally executed by conventional fighters, single-engine types which went into combat without armament (guns or bombs) in an effort to improve performance.

An analysis of the air war over Germany discloses similarly high dividends despite the handicaps inherent in early experimentation. The rammings on 7 April 1945 were the *Luftwaffe's* sole attempt at such tactics and were carried

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<sup>5</sup> Sherman, *Air Warfare*, previously cited.

<sup>6</sup> *Reference Manual on Body-Crash Attacks Against B-29s*, previously cited.

out by a special unit recruited a month before from among all German Air Force pilots. The ramming organization, known as "Sonderkommando Elbe," consisted entirely of volunteers who received a ten day training course. In at least one case we find the USAAF losing twenty airmen and two heavy bombers to a single *Luftwaffe* fighter (Me-109) and this German pilot is believed to have effected a successful bail-out prior to the impact.<sup>7</sup>

Soviet communiques early in World War II frequently mentioned deliberate collisions by pilots of the Red Air Force. Two distinct methods developed by the Russians were--ramming with the undercarriage lowered, and clipping the enemy's control surfaces with the propeller blade. Both these methods increased pilot survival but minimized probability of target destruction. Nevertheless, there were occasions when Soviet pilots sacrificed their lives in deliberate rammings, as in the case of Pilot Sergeant-Major Totmin, who deliberately rammed a German fighter in a head-on attack.<sup>8</sup>

It is evident that if the Japanese, German and Russian fighter pilots would have been given some promise of survival, even though small, the success of operational ramming tactics would have materially increased. Interrogations of Japanese pilots indicated that even among these fervent individuals there were some who were not psychologically "sold" on the "death sentence" implied in conventional rammings.<sup>9</sup>

World War II records of the U.S. Marine Corps show that Americans too have profited from the employment of deliberate aerial rammings. One of the earliest incidents occurred at Guadalcanal, on 25 October 1942, when Lt. Jack E. Conger in an encounter with some Zeros over Henderson Field rammed one of the Japanese fighters. Both Conger and the Jap pilot bailed out and landed safely, the Jap to be taken prisoner. In the anti-bomber category we find Lt. Robert R. Klingman

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<sup>7</sup> Mission of 7 April 1945, 389th Bombardment Group (H), 8th U.S. Air Force.

<sup>8</sup> *Air Progress*, Vol. 2, No. 1, January 1943, p. 33.

<sup>9</sup> Author's interrogation of Guy Toko (Japanese Army Air Force Pilot), Tokyo, October 1945.



making contact with a Nick, on 10 May 1945, in the vicinity of Okinawa. When his guns jammed he rammed the Nick and chewed off the tip portion of the rudder; then he made two more runs, tearing off all the rudder and the right stabilizer before the Nick went into a spin and was splashed. Ramming once again paid dividends.<sup>10</sup>

HOW WOULD American airmen receive the possibility of being employed in sure-death rammings? Most assuredly such a proposal would not be welcomed with open arms; but, nevertheless, there are undoubtedly numerous United States Air Force and Navy pilots who would be willing to employ deliberate rammings against so important a target as an A-bomb carrier if an American city could thereby be saved. However, the employment of specially designed aircraft precludes the need for reliance upon haphazard attacks of a suicide nature. A specialized aircraft would not only greatly increase the destructive potential by employing efficient warheads, proximity fuzes, etc., but furthermore could insure much greater than a fifty-fifty chance for pilot survival by incorporating automatic ejection of the pilot prior to impact, possibly in an armored pressurized capsule. Psychological research by the Air Force indicates that the American combat airman will consider a combat operation acceptable if it offers a fifty-fifty chance of survival.<sup>11</sup> In this respect it will be recalled that many crews of the United States 8th Air Force voluntarily flew combat tours which offered less than this "acceptable" survival probability. There is every indication that planned rammings with special missiles would result in a much higher chance of survival.

The use of the rammer offers major tactical advantages over the conventional fighter. It can be employed as a gun-firing or rocket-launching fighter with conventional pursuit tactics at close range, deferring the ramming if a "kill" is otherwise scored. The use of armor can be maximized in

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<sup>10</sup> *War Diaries and ACA-I Reports*, Hqs., U.S. Marine Corps, Washington, D.C.

<sup>11</sup> Hastings, Dr. Donald W., "Basic Workings of the Human Mind," a lecture to the Air War College, 30 September 1946.

designing such a weapon. Steel plate has never been fully exploited because of the inherent limitations it placed upon range and "dog-fight maneuverability," two characteristics unessential to the rammer. Further, ramming opens up a relatively unexploited avenue of attack, the "collision course." This mode of attack insures earlier interception plus a probability of target destruction which cannot be approached by the conventional gun-carrier. The machine-gun fighter is generally incapable of scoring sufficient lethal hits in a "fly-through" or "beam" attack, but the rammer may capitalize on this tactic and, incidentally, avoid the generally heavy tail defenses of the bomber. During the collision course attack a point is reached (the distance depending upon speed and angle) where, due to the high speeds of modern aircraft, the collision is unavoidable even if detected by the bomber. Upon reaching this point the pilot could be ejected.

But why worry about ejecting pilots at all? Why not employ pilotless aircraft against attacking bombers and thus completely avoid exposing pilots? It is envisioned that the employment of guided missiles will become a major factor in air warfare. However, perfection of the remote control of pilotless missiles over appreciable ranges is still being sought. Piloted missiles, on the other hand, not only fill the gap for a potentially successful interim weapon, but furthermore will offset the possibility of exhausting a nation's resources through extensive fixed-defense installations for ground-to-air missiles. Piloted missiles are highly mobile.

No strategic bomber mission has ever been turned back by either anti-aircraft or gun-carrying fighters, but the value of bombers as targets has increased a hundredfold with the advent of the A-bomb. The need for guaranteeing destruction of such bomb carriers has likewise increased, thus requiring a specially designed expendable defensive rammer to insure such destruction, as a supplement to the conventional gun-carrying fighter.

The Japanese Navy's *Sakura Oka-11 (Baka)* ramming aircraft operated in this category, but it was not highly efficient

in its World War II experimental stage and its employment was restricted to surface targets. Later models were planned by the Japanese to overcome the combat problems of insufficient range of the missile and extreme vulnerability of the *Oka-11*'s mother aircraft, the Betty. In the Japanese Naval Air Force's *Oka-43* (non-operational) a step was taken in this direction with an increase in range from twenty to one hundred and fifty statute miles over the operational *Oka-11*, which was little more than a piloted glide bomb. Jet propulsion was to replace the solid-fuel rockets; and future plans also considered ground and water launchings from remote localities.<sup>12</sup>

AT THE WAR'S END in 1945, we find the nearest logical approach to such a specialized rammer in the *Luftwaffe*'s piloted FZG-76 (a manned V-1 Flying Bomb). Here was a weapon with a comparatively long range and a relatively effective warhead. However, like the Japanese *Oka (Baka)*, the piloted V-1 was planned for employment against shipping targets due to the intrinsic value of such vessels during World War II. In earlier stages of development we find other categories of German piloted missiles designed specifically for employment against airborne targets: examples are the ground-to-air *Natter* and the Zeppelin Company's air-to-air ramming aircraft, both types being rocket propelled. (See Figure 2.)

The World War II yardstick indicates that if ten percent of the attacking aircraft are shot down, including kills after *leaving* the target, the air defenses have been very successful. The theory is that no air force could long operate with such an attrition rate. This is to say, no *World War II* air force carrying conventional bombs. But this is 1948 and three years since the advent of the atomic bomb. The so-called "high" 1939-45 attrition rate of ten percent is no longer applicable. We cannot afford to allow ninety percent, or even fifty percent, of the enemy bombers to penetrate our perimeter. How long need an air force operate

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<sup>12</sup> Author's interrogation of Captain Yamanoue (Japanese Army Air Forces), Singapore, November 1945.

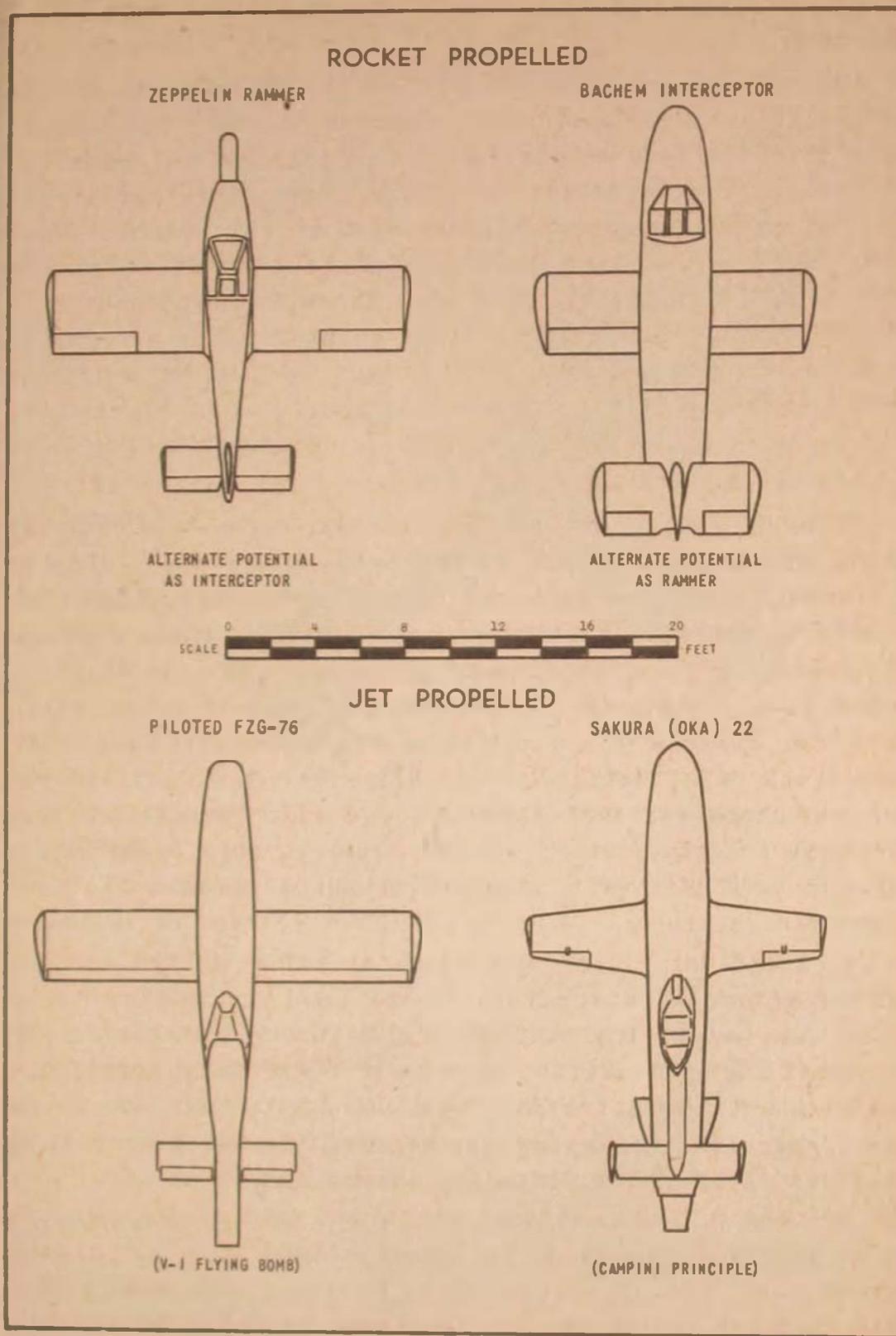


FIGURE 2. Some Experimental Rammers of World War II.

if it can deliver fifty percent of its A-bombs over vital targets?

Defense weapons have not kept pace with advances in the offensive. Bombers have always managed to reach the target. Some thinkers look to the future and foresee the defensive pilotless guided missile as possibly more than equalizing the offensive-defensive balance between air weapons. However, we must realize that with perfection of defensive missiles, offensive missiles will likewise move apace at a rate that will probably continue to prohibit a successful defense. Ramming tactics, on the other hand, offer a defense weapon with very little chance of successful counter-measure, and there is no technological barrier retarding the *immediate* successful application.

There is sufficient evidence on hand as to the military worth of ramming tactics as employed in the past, despite the early handicaps incurred by haphazard employment. Advances in technology will not prohibit the future practice of ramming and, in fact, with automatic radar tracking and other homing devices (photo-electric, thermal, acoustic, etc.) the chances of success should be materially increased, especially when incorporating efficient warheads and employing sound tactics. Above all, it must be realized that the past successes in air-to-air rammings were by makeshift conventional aircraft usually without a warhead and frequently without guns or armor. The installation of automatic pilot-ejection devices and adequate armor protection can assure the missile pilot of an acceptably high chance of survival, especially in view of the almost invariable employment of this defense weapon over friendly territory. Such a weapon might incorporate automatic ejection of the pilot and simultaneous priming of the time-delay warhead by employing a proximity nose-fuze. (See Figure 3.)

There is a standing requirement for an effective weapon to *supplement* conventional anti-aircraft defenses. We urgently need an interim weapon to fill the gap between conventional fighter aircraft and efficient guided missiles. Pending the perfection of the pilotless missile we must utilize all available means of increasing the attrition rate of enemy

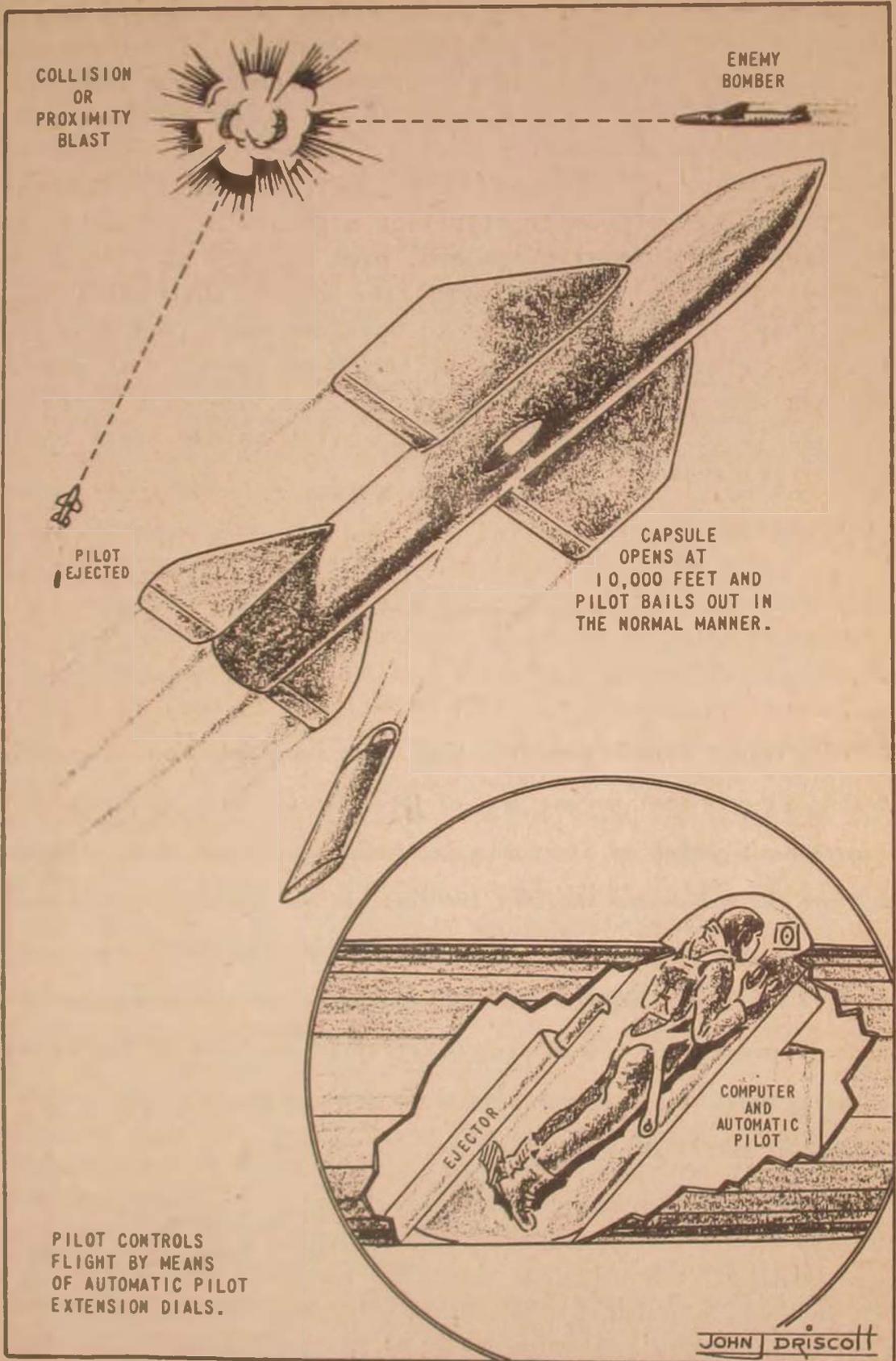


FIGURE 3. A Suggestion for Air Ramming with Pilot Ejection.

bombers. Bomber "kills" can be increased to a limited degree by exploiting the higher destructive probability offered by a specialized close-in fighter (heavily armed and armored). The hit probability increases when the range is shortened, suggesting the desirability of a close-in multi-rocket or bomb launcher. It appears very likely, however, that the maximum degree of bomber attrition might well be reached by employment of defensive rammers, even if only as a final or last-ditch effort. In any event the weapon must be *on hand* and ready. It is unrealistic to consider much less than one hundred percent destruction of the first assault of atomic weapons. The first attack may be the last. The only alternative is to hit the enemy launching sites before their bombs leave the ground.



*Anti*aircraft defence was effective if it succeeded in consistently destroying more than ten per cent of the attacking force, for when that figure was reached no air force could maintain large-scale attacks. But any counter-device short of the complete and absolute antidote--an ideal scarcely ever achieved in history--would be of little use in the case of weapons of saturation. Even if some defensive development of radar succeeded in eliminating ninety-five per cent of the atomic missiles used, the five per cent which reached their target would be capable of saturating it.

-- E. M. Friedwald  
*Man's Last Choice* (1948)



# EMPLOYMENT OF STRATEGIC AIR POWER

*Colonel Thomas E. Moore*

FROM 1919 through 1925 General "Billy" Mitchell, assisted by such young Air Corps officers as Andrews, Arnold, Spaatz, Doolittle, Knerr, McNarney, and George, propounded the idea of Air Power. They visualized large and fast bombers (200 mph), capable of carrying bombs for relatively long distances, bombers which could sink battleships and bomb factories behind enemy lines. They put on successful demonstrations with what meager equipment the Air Corps had. But all was seemingly in vain. The public eye was blinded with complacency, an aftermath of the first World War.

It was not until the air mail crisis of 1934 that the public was awakened to the fact that something had to be done to improve the quality of our service planes. The airmen of General Mitchell's faith were quick to rise to this occasion and successfully effected the organization of the GHQ Air Force under General F. M. Andrews in 1935. The same top brass who had previously branded these airmen as dreamers and worthless visionaries were once again perturbed, and proceeded to harass the development of Air Power with more vigilance. They bore down with such wrath that the GHQ Air Force was disbanded in 1939. But the airmen had succeeded in channeling their funds into the development of their dream child--the B-17 Flying Fortress. Thus was the strategic concept kept alive and given rebirth.

Now, the Army Air Corps had a prototype, at least, of an airplane that could penetrate the enemy's interior and bomb his industry, transportation, and supply depots; an airplane that could wither his vitals "to the point where his capacity for armed resistance is fatally weakened." But this was not enough: one airplane could not do the job. That airplane had to be improved and constructed in great numbers. An accompanying fighter escort was necessary for protection. Then came World War II.

At this point the proponents of Air Power and strategic bombardment really came into their own. They duly advanced to high positions, gained representation on the General Staff, and received adequate appropriations for aircraft development. But only the theory had been accepted; the real test of proving the case was yet to come. Great expansion was necessary. This included recruiting and training of personnel; contracting for and procuring new aircraft and allied equipment; establishing air routes for fast supply; construction of thousands of training, operational and supply bases. All this took time, enough of which the United States fortunately was granted. As General Spaatz stated in *Foreign Affairs*, April 1946, "More than two years of peacetime expansion [from the summer of 1939, just before the war began in Europe, to the summer preceding Pearl Harbor] resulted in an increase in the personnel of the Air Force by tenfold, but even with this increase it remained relatively ineffective by any standard." Then came the productive years of 1942 and 1943. The unparalleled industrial might of the United States was in full swing. Aircraft production rose so rapidly that by the end of 1943 the Air Forces had 64,000 aircraft as compared to 12,000 at the beginning of 1942. Army Air Forces personnel realized an increase from 334,000 to 2,373,000 for the same period. This Air Force was being battle-seasoned as it grew; the new Air Power weapon was undergoing a service test over Hitler's Europe; the strategic concept was finding acceptance.

IT WAS in January 1943 that the Joint Chiefs of Staff decided that the business of bombing out the enemy's vitals would pay dividends. There were many factors to consider, such as destruction of the enemy's fighter forces, neutralization of his anti-aircraft defenses, and proper target selection. Nevertheless, by mid-1944 the onslaught of the combined heavy strategic bomber offensive against Germany had reached destructive proportions. The British were bombing by night and the Americans were bombing by day.

Monthly bomb tonnage on the target rose from 20,000 in July 1943 to 140,000 in June 1944. This figure increased to 206,457 tons for March 1945. Destruction caused by these heavy loads "fatally weakened" Germany's ability to make

war. Her major industries were ruins; her petroleum products were burned and destroyed and her transportation was hopelessly snarled and immobilized. She was a defeated nation left with insufficient factories and supplies to support her ground forces. The strategic air concept had been fully realized long before the invasion of Germany by our own ground forces.

In surveying the success of the strategic concept in this air war with Germany, there are several major considerations worthy of emphasis:

(1) The AAF bombed the enemy with the B-17 and the B-24, airplanes having a combat radius of action of little more than 600 miles, and a load carrying capacity of two tons.

(2) The B-17 was more than twelve years from the drawing board to fighting fitness.

(3) England provided a well defended air base within 500 miles of the enemy's heart.

(4) All our personnel, bombs, fuel, equipment, and supplies had to be transported 3000 miles over exposed supply lines to England. The logistic cost of this endeavor, disregarding time, is measured in billions of dollars.

(5) The United States had four and one-half years to prepare its bomber offensive against Germany.

(6) A measure of air superiority had first to be obtained before the bomber offensive could be launched effectively.

THUS FAR no mention has been made of the B-29 and its employment against Japan, since the initial strategic effort was against the *Reich*. Long before the beginning of World War II the AAF realized the need for a bomber with greater range and load carrying capabilities than the B-17. Aircraft designers and manufacturers were advised of this, and their efforts led to the now famous B-29. This revolutionary aircraft went on the production lines in 1943. It is interesting to note that the general public erroneously believes the B-29 was hatched practically overnight and entered battle the following morning. True enough the airplane went almost directly from the production line to the front and its service testing was done in actual combat.

But more interesting still is a fact brought out by J. Carlton Ward, Jr. in his report "Industrial Planning A Safeguard of Peace:"

As engineers, let us turn to some of the underlying, fundamental considerations with which we technicians must deal.... This very heavy bomber, [the B-29] which was a logical development of its predecessor, the B-17 Flying Fortress, *required eight years* from inception to combat, or a period longer than the entire World War II by several years. Summarizing the B-29 development, there were eleven major design studies before it was committed to metal. The wind tunnel tests had to be evaluated before the prototype could be constructed. Prototype and static test articles had to be furnished in metal, after which flying tests had to be conducted and translated into further engineering changes. The engineering changes in turn brought forth further production models. Accompanying all this was elaborate production engineering and tool design. Finally the plane had to be refined through service tests and preliminary combat experience. Only then was it a combat airplane.

When the B-29 went into action against the Japanese in June 1943, the AAF was on the threshold of realizing complete fulfillment of its strategic air concept. The first wing of these B-29s had to be based in India and stage its operations through China in order to get near enough to the Japanese homeland to deliver effective blows. This most modern of all modern bombers was limited in effective radius of action to 1500 miles with a 20,000 pound bomb load. (1800 miles radius of action was possible by sacrificing bombs for fuel.) There were many other logistic disadvantages which will be pointed out. With American industry behind the program, however, B-29 units expanded from India and China to the vast installations of the 20th Air Force in the Marianas, a group of strategic island hop-off points acquired by the Navy only 1500 miles from Japan proper. The committed force had grown from one wing to five wings by 1945. A single combined B-29 mission delivered as much as 6700 tons of fire bombs to the Japanese key islands in a single raid. The world knows how this unrelenting strategic air effort destroyed and burned out the enemy potential to such a devastating degree that the Japs capitulated in August 1945 without having been invaded by our ground forces. Thus the strategic air concept had succeeded beyond its inceptive dreams.

These vital facts are indeed astounding and give rise to thoughts for the future. The ultimate objective of the strategic air arm will always remain the same, but the method of employing this powerful force must give way to new weapons, improved explosives, and new air concepts. Sound consideration of the future is not possible, however, without first examining present trends and policy.

The postwar Air Force presents many complex problems. To salvage even a pretense of an Air Force from the hysteria of demobilization is in itself a mammoth task. Nevertheless, the mission of manning, training, and deploying our air strength so that it is capable "of defending the integrity of the United States...and enforcing the United States foreign policy" becomes more complex as the nature of weapons change. This has been appreciated by the Air Force to the extent of widespread expansion in the field of organization for research and development.

**I**N EXAMINING the problems of the Strategic Air Command it is interesting to note that very little change in overall strategy has been contemplated for the near future. The Strategic Air Command will employ the improved B-29 (the B-50), with an extended radius of action, and based on a network of bases around the perimeter of the globe. These bases are necessary to enable the short-range aircraft to reach vital targets. They are expensive and they utilize excessive manpower. Diplomatic and political problems will ensue from their acquirement. Long supply lines must be maintained and protected. In short, the pattern is no improvement over that of World War II; if anything, it is worse. Who is going to defend these remote bases? Would they not be easy prey for any attacker?

Extensive training is now going on in Alaska on the premise that this country may some day stage strategic operations through the polar regions. Thus it seems that the present faith, at least, is tied to the methods established in World War II, and the limited range of the B-29. This costly business of keeping up many bases and extended supply lines is apparently to continue. Will we never learn? Have we no faith in the B-36?

Even though our policy is hide-bound in that for the next five years we can merely utilize our leftovers from the past war, there is considerable promise in present trends as they aim toward the future: Bigger airplanes and greater speeds seem to be the watchwords. We might say that present thinking takes these vital factors into consideration:

- (1) Increased range and speed for bombardment aircraft.
- (2) The destructive capabilities of the atomic bomb.
- (3) Jet and rocket propulsion.
- (4) Guided missiles.

Notwithstanding these considerations it is pertinent to point out some of the observations of our great military leaders. General Devers has stated recently: "You can't go there and come back home, you gotta land someplace." This is truly a ground commander's concept and is no doubt aimed at the creation of airborne armies for future wars. On 28 January 1947 General George Kenney stated at the Air University: "In future air warfare, say over the Polar Bowl, we can do two things: build a huge bomber and send it over and get it shot down, or you can modify the landing gear [meaning the new tractor tread type] to land any place without runways and sustain the operation with air transported supplies." This deduction does not seem to favor the long-range bomber and neglects the fact that man cannot long endure the arctic regions without extensive logistic preparations. It does not solve the problem of logistics; it rather complicates the issue and would tend to disperse our forces hopelessly.

Aircraft design and construction is already in progress on truly long-range large-scale bombers. "In order to get range we must build them large." That the size of the machine is no foreseeable handicap is borne out by a statement made 3 March 1947 at the Air University by Colonel Carl E. Reichart of the Engineering Division of Wright Field. He stated: "We are not through until we have reached 25,000 miles range. Such a plane would circle the globe, of course, and could easily deliver its bomb load on any target in the world without landing at any place other than its home station.

It must be emphasized that the trend toward the development of these super craft was fostered by the inception of the atomic bomb and that they have become physically possible

through the development of jet and rocket propulsion. Protection against enemy action must always be considered in any bomber operation. Lieutenant Colonel Warden of the Bomber Development Section of Wright Field points out that these new bombardment airplanes may carry their fighters with them on an operation, either internally or towed behind as gliders. These fighter craft could be released when enemy action is encountered and picked up again when the action is over. Resistance to enemy guided missiles should be incorporated within the bomber in the form of radar detection and jamming devices.

WHEREAS THE PRESENT policy governing the employment of strategic Air Power is restricted to the techniques and methods derived from presently available equipment, the developmental trends imply the necessity for extensive revision. This was significantly expressed by Dr. Bernard Brodie in a lecture at the Air University on 25 March 1947: "Just as our modern physicists have been forced to find new units of time, micro seconds, etc., we must change our military concepts, processes, and techniques as a result of the invention of the atomic bomb."

To preface the actual formulation of a future plan for the employment of strategic Air Power it is wise to appreciate the observations of General Spaatz as stated in his thesis, "Strategic Air Power--Fulfillment of a Concept." The following extracts are significant:

(1) Another war, however distant in the future, would probably be decided by some form of Air Power before the surface forces were able to make contact with the enemy in major battles. That is the supreme military lesson of our period in history.

(2) In the next war, should there ever be one, four and a half years will not be allowed us in which to build up our Air Force, insured by the resistance of our Allies to common enemies. America will be target Number 1. We will stand or fall with the Air Force available in the first crucial moment.

Thus again it is most forcefully implied that we must maintain effective strategic Air Power in being, ready to go on a moment's notice. The long-range super aircraft is not an economic monstrosity but a weapon made necessary by

the advent of the atomic bomb. From a practical operational analysis of President Truman's release to the public in 1945 that one atomic bomb is equivalent in destructive proportions to 20,000 tons of TNT, we may conclude, says Dr. Brodie, that "one hundred planes carrying atomic bombs can do the work of 20,000 planes using conventional bombs."

We have learned that to increase the range of an airplane perceptibly, we must also increase its size and gross weight. It is significant that a great circle course from Chicago to Karachi, India, passes over the North polar region and all of Eurasia, (directly over Moscow at the 5000 mile marker) the total distance being only 7650 miles. Since a preponderant majority of all strategic targets lie in the Northern hemisphere, we need build a radius of action of only 8000 miles into our bomber in order to strike them and return to bases in the United States.

**A**SSUMING THAT the old strategic concept has been fulfilled and that *employment* comes before *characteristics*, a plan for the future can be conceived. Let us dispense with our maze of inaccessible strategic air bases around the perimeter of the globe and determine to employ our strategic Air Power from the continental confines of the United States. Let us plan to dispatch our super craft individually, or in small numbers, to deliver the atomic charge to enemy objectives during hours of darkness, relying upon speed, altitude, and built-in devices for protection. This proposal would provide the following important advantages:

(1) It would stimulate and require the development and construction of a super long-range bomber capable of delivering an atomic bomb to any strategic point in the Northern hemisphere and returning to base. This bomber would carry along its own fighter protection and anti-aircraft counter-measures.

(2) It would serve to protect the nation's economy by pulling home our strategic air investment.

(a) It would reduce the number of airplanes necessary "to protect the United States and carry out her foreign policy."

(b) There would be an inestimable saving in manpower and personnel incident to this more potent but reduced force.

(c) There would need be only a relatively small number of super bases located throughout the United States as compared with the vast and defenseless network of bases around the globe now contemplated. These homeland installations could more readily be placed underground (except for the runways) for protection against enemy atomic attack.

(d) Logistics would be simplified. An end would come to the hazards of the 11,000 mile transportation problem.

(3) This new concept would guarantee direct and positive control of the entire strategic air effort by the highest military authority in the United States on a moment's notice.

Our most profound realization today is the fact that the aggressor in the next war will strike swiftly, devastatingly, and without warning. There will be no time left to prepare once hostilities have begun--it must be done now. Let us have the courage of the pioneers of Air Power who perpetuated the development of the Flying Fortress by first visualizing what it could do. Let us not forget that a bold concept brought victory in the last war, and that only by developing another will we survive the next.



*The air has become a highway which has brought within easy access every point on the earth's surface--a highway to be travelled in peace, and in war, over distances without limit at ever-increasing speed. Continued development is indicated in the machines and in the weapons which will travel the reaches of this highway. The outstanding significance of the air in modern warfare ... must govern the place accorded Air Power in plans for coordination and organization of our resources and skills for national defense.*

# EDITORIAL

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BY MAJ. GEN. DAVID M. SCHLATTER

**T**HAT WE SHOULD have an Air Force second to none is seldom questioned by thoughtful citizens today. Air Power must do its share to preserve peace until the United Nations becomes effective.

For a strong Air Force four accomplishments are generally recognized as necessary: (1) conducting of a research program for continued leadership in technological development; (2) developing and procuring of materiel to fully exploit the research program; (3) recruiting sufficient capable personnel; (4) training of such personnel as individuals, crews, and units to assure an effective organization.

However, there is a further requisite, one too often accepted as capable of being met on the spur-of-the-moment. This is adequate leadership, made possible only by development of correct doctrines and methods of employment and education of future leaders. Development in technology must be continuously paralleled by an equally vigorous and scientific program of development in doctrine or methods of employment. Our future commanders and staff officers need to be thoroughly familiar with these doctrines and methods in order to solve future military problems. Adequate leadership must be assured regardless of prevailing circumstances and conditions.

Many of the astonishing blunders made in past wars can be traced to faulty doctrine and inept leadership. To overcome these deficiencies sound precepts must be developed, and these doctrines must be understood. Our future air commanders and staff officers must acquire the techniques and skills, the professional knowledge, and particularly the capacity for fundamental original thought which future responsibilities will demand.

The problem is Air Force wide in scope. The Air University in all of its component schools and colleges is dedicated to the search for new methods of strategy and tactics, and to mental development and stimulation of those who will employ these precepts. However, more than ninety percent of an Air Force officer's career will be spent on general duty and less than ten per cent pursuing formal courses of instruction. The stimulation of the formal courses must be continued and enlarged by the efforts of each individual officer fully to exploit his own capabilities.

As career officers in the United States Air Force our lives are dedicated to the service. Even a lifetime is too brief for acquiring fully the techniques, skills, ethical and professional understanding that we need to meet future responsibilities. All of us can not reach the very top. But the paradox exists that there is always plenty of room there for those who are truly capable. We have no time to waste.

# AIR ANTHOLOGY

## EARTH AND AIR

### I

Earth is the tower of granite, the floor of loam,  
The grass that seeds, the sheep that fatten for men,  
Shapes that are beaten in fire or built in wall,  
The plow preparing the soil to be born again;  
The crystal well, the gold of the honeycomb,  
The hands that pattern with wool or hide or clay;  
Earth is the wain, the sickle, the sledge, the stall --  
    Earth is our yesterday.

### II

Air is the thrust of steam and burning gas,  
The spark men take from the foam of a falling stream,  
The word of the first sea caught on the last of the seven,  
Ships with the speed of a dream made more than dream;  
The throb of steel in a cage of steel and glass,  
Iron fingers at smooth and gleaming play,  
Air is the wings of men on the sea of heaven --  
    Air is today.

### III

Earth is the suck of men, their loaf and their healing;  
With earth they are poor but sapful, driven but strong;  
Air is a high, thin world where their eyes grow weaker,  
Their round breasts flatten, their cheeks fall white and long.  
Air is a shifting floor and a viewless ceiling,  
Genii building and wrecking and building again,  
It is a half-heard magic speech from a hidden speaker  
    Sounding through light and rain.

### IV

Men with the vision of air went planning and building;  
They dreamed of slaves of iron and wrought their slaves;  
They envied the wind and the eagle and spread their wings  
Above the shadow of sinking woods and waves.  
Men made little suns for the midnight's gilding,  
Bridged with their wires the bridgeless gap of seas;  
They dulled the teeth of winter, they turned the stings  
    And withering of disease--

## V

Men with the dream of air have climbed to their vision,  
 But now they are faint for the meat of a day gone by;  
 The steeds of the sun race on in a golden madness,  
 The hurtling drivers are pale in the height of the sky.  
 Some say: "Hard Fate in a wrath and a great derision  
 Has laid the tools of gods in the hands of men;  
 Can dust breed stars? Can tears be distilled to gladness?  
 Let us go to earth again!"

## VI

But the many hear not, the millions follow their dreaming  
 Driving their iron cattle on stone or steel,  
 Flying their iron hawks on an airy ocean,  
 Bearing children that play with the spark and the wheel.  
 They will never turn from swiftmess and silver gleaming  
 Or the sense that he who has taken in wheel or rod  
 The staff of gods and the magic of god-like motion  
 Himself shall become a god.

## VII

Perhaps they will come again to the sun and the bough,  
 The wind and the clod that once were their strife and their fare;  
 They will take not of olden beauty or olden toil;  
 They will only come back to earth when earth is air:  
 When they girdle peaks with their pavements and send their plow  
 Like a whirl of wind, and store their snow and their sun,  
 And sow where the strength they have sifted into the soil  
 Yields five instead of one.

## VIII

Look back, then, you who had love for earth and regret her,  
 And mourn a change that harries your hill and sky;  
 For men are turned from the peace of the scythe and candle;  
 Their eyes are fierce for the bright and the swift and the high.  
 They have wrecked a world for the leaping dream of a better,  
 And gone from peace toward a peace beyond a war,  
 They have mounted untrodden stairs to a key and a handle  
 That open a door.

--Frank Ernest Hill, *Stone Dust* (1928)  
 Reprinted by permission of  
 Longmans, Green & Co., New York.

## DEATH OF A BOMBER

We saw the smoke. The blue skull of the sky  
 Scarred on the black trail of the running fire.  
 The world came out of doors and every eye  
 Turned on the afternoon, while higher and higher  
 The sirens mounted and the watchers' breath  
 Drew in and waited to be first with death.



It was choice: to parachute or ride.  
 It was a race: fire against altitude.  
 He chose to land. Which way would fire decide,  
 Lapping the tanks, racing to be renewed  
 Into the thundering of exploded gas  
 While the charred midgets cometed to grass?



We stood and watched and each man watched his own  
 Possible future flaming to arrive.  
 By never ending inches she came down  
 Bringing the living back to stay alive.  
 Still with a sky unclosed, we saw her shed  
 The first burnt metal, flaking down and dead.



We counted distances by fractional  
 Unending seconds till her wheels might touch.  
 While fire grew wider till it lavished all  
 The warping wing, and something came to clutch  
 The circled silence of the afternoon,  
 And the long smoke rode her like a black dragon.



First feet, then inches. Still a roof above  
 The blurring ground, the burning engine spat  
 Clear from the melted wing and dove  
 Spilling its flame into the landing mat.  
 And still the wing held and the sky thinned out  
 Between her and the ground, and with a shout



We heard the brakes squeal, saw the midgets dive  
 Like dervishes toward grass and rise and run  
 Across the sweet returning of their lives.  
 We counted out the crew and one by one  
 We saw death leave us, and from roof and wall  
 The held breath broke, as sudden as a squall.



We stood in circles when they brought them in,  
 And offered cigarettes and held the match,  
 Not certain where to let their lives begin  
 Nor our held breaths after the silent watch.  
 And then it thawed, and inches past a doom  
 Were all the spaces of the afternoon.



We turned and waited till the fire reached home  
 And saw the tanks blow and the monstrous cloud--  
 Orange and black upon the air's blue room--  
 Slant up through miles of air, the emptied shroud  
 Still holding us. And crackling down below  
 We heard the roasted ammunition go.



It took an hour to burn down and be done.  
 We watched and memorized it flame by flame,  
 Our faces mirrored in the afternoon  
 With death gone by and fire become a game.  
 And when we left the last fire and last smoke  
 Someone began a drawn-out bedroom joke.

--John Ciardi, *Other Skies* (1947)  
 Reprinted by permission of  
 Atlantic-Little, Brown & Co., Boston.

# FOREIGN HORIZONS

## SUPPLY AND TRAINING OF AIR OFFICERS

Digested from *The Aeroplane* (London), 26 November 1947.

**D**ISTINGUISHED officers of the Fighting Services spoke of the system by which officers are provided and trained, in a series of short lectures at the Royal United Service Institution on November 19.

Air Vice-Marshal J. W. Baker, Director-General of Personnel, Air Ministry, described the new set-up of the Royal Air Force. He said that the organization was functionally complicated by the fact that in 30 years the Royal Air Force had known the biggest technical development the World had ever seen, particularly in aviation. In the beginning there had been only three branches; the General Duties, Equipment and Accountant. General Duties officers had to undertake all technical and administrative duties as well as flying, gunnery, armament, and so on. Officers had been taken too much from their main duties, and reorganization had now provided five main and five subsidiary branches. The five main branches were General Duties, Equipment, Technical, Secretarial and the R.A.F. Regiment. The other branches were Air Control, Catering, Physical Fitness, Marine Craft and Provost.

The short-service scheme had been used to gauge the qualification of officers, and permanent commissions were available for those who proved most suitable. He explained that in the General Duties (Flying) Branch, young officers got responsibility for tactical leadership at an early stage and it was necessary that they should show devotion to duty when working by themselves. They had not the same external lead as officers working in a ship or with a section. They were chosen especially for integrity, ability and responsibility.

The pre-War short-service scheme was to be extended to the majority of branches, but it would not be used in the

Technical Branch, which now includes engineering, signals and armament. In this branch, airmen were being commissioned from the ranks, many of them highly skilled tradesmen from the Air Force's own Technical Training Schools who could go on to the Universities. Officers were also appointed direct from civil life with University degree standard.

Commissions from the ranks normally go to the men with eight to ten years' service, five of which has been on air-crew duties. If recommended for commissions, they go to the O.C.T.U.; all regulars appointed get permanent commissions.

The Secretarial and Equipment Branches and the Regiment all have short-service schemes. The Secretarial and Equipment Branches are less popular than the G.D. Branch, and it is into these two that it is intended to integrate the women's section.

The chief entry into the G.D. and other main branches is by way of the Civil Service examination (common to all three Services) and Cranwell. For the G.D. Branch there is a special medical and flying-aptitude board and the R.A.F. Selection Board. There are a few entries from the Universities, but these are primarily graduates with honours degrees for the Technical Branch. The G.D. Branch of the future will be the principal executive and flying branch, with training for tactical duties and advancement to higher command.

There has been a big change in the flying training side. The Elementary, Service and Operational Training Schools of the past have all been done away with and the all-through training scheme whereby flying training is all done in one unit up to the operational conversion stage. Pilots and navigators meet and crew-up with signals and armament at the Operational Conversion Unit.

Air Vice-Marshal Baker then spoke of the effect of radar and other developments on the design of aircraft and said that this had a bearing on the importance of the Technical Branch. In future direct-entry technical officers would get flying training before they took up their technical duties. Their training would be in two stages, the second of which would introduce them to recent scientific developments and fit them for the interchangeability of duties necessary for higher rank.

Cadets for the Equipment and Secretarial Branches would in future be trained in a new wing of Cranwell, so that they would have a common background with the G.D. Branch.

Of the R.A.F. Regiment he said that by courtesy of the Army, direct-entry officers would be trained at Sandhurst. The regiment would be largely responsible for the general-service training of the R.A.F., including combat -- training designed to make them responsible for their own defence.

Short-service officers would get their O.C.T.U. course, general service and professional training. For regular officers there was the Administrative Course, the Staff College, the Joint Services Staff College, attachment to the other Services and to the Dominion Services, the Staff Colleges of the other Services and the Imperial Defence College.



## ESSENTIALS OF ANY FUTURE MAJOR WAR

By

Captain R. A. James, M.C., "The Bertrand Stewart Prize Essay, 1947."

Digested from *The Army Quarterly* (London), January 1948.

**W**HEN considering the fundamental differences between the last and any future major war, we must concentrate only on those essentials on which to-day there can be least doubt. These essentials can be grouped under six headings. Any future major war will differ from any past war by being a war of extreme violence; of new weapons; and of decisive but altered air attack. It will be a war begun without warning; it will probably be a brief war; and it will be a war in which there will still be the need for armed forces of all descriptions, but with an altered role and importance.

First, then, any future war will differ from the last war by its extreme violence. This may not seem a fundamental difference to those who have seen Essen, Cologne, Hiroshima or Nagasaki; or who witnessed the D-Day bombardment of the Normandy coast. Yet all this would seem slight in comparison with the explosive power and destruction of a future war. For it will almost certainly be a war of wide use of the atomic bomb; and this will mean a war of general atomic bomb destruction, which the last war was not. Again, the atomic bombs used will be more devastating in their effect than

those dropped on Japan, and they will be more indiscriminately dropped. The civil populations of the belligerent nations will forgo even their comparative safety over the armed forces in the last war. No wide knowledge of atomic bombs is required to realize that any world war of the future will be a war of slaughter and material destruction on a scale never before seen or even imagined in human history.

Secondly, a future war will be a war of new weapons. Or at least a war of old weapons so developed, altered and improved that they are no longer recognizable as related to their original shapes. A curtain hangs over all research into atomic warfare, but little imagination is needed to realize what wholesale explosive power more modern atomic bombs may be made to contain. The "V1" and the "V2" only demonstrated the use of the rocket projectile in its infancy. Both of these inventions left wide scope for improvements in accuracy, control and destructive power. A combination of the rocket and the atomic bomb is almost an inevitable development. Radar, jet propulsion, stratospheric flight, bacterial warfare and many minor scientific inventions have opened up wide new fields of possibility for the invention of new instruments for military attack or defence. It would be foolishness itself not to imagine that scientific research linked with human inventiveness and ingenuity will not produce a whole crop of new weapons in any future world conflict.

Thirdly, any future war will be a war without warning. Already the world has reached a condition of unscrupulousness where the use of the ultimatum, of the time limit for an answer, of the presentation of due notice, and of all the other regalia of pre-twentieth century wars are well and truly symbols of the polite past. To-day troops march over a frontier and a war has begun. But the next war will be without even the warning that troops are on the move or are massing along a frontier. It is not too fanciful to imagine that a war might begin against this country by a dozen travellers arriving in England by official or unofficial means. Each traveller would carry a suitcase containing an atomic time-bomb. These suitcases could then be deposited in waiting-rooms in the centre of the main industrial cities.

A few hours later enormous and perhaps utterly disastrous explosions throughout the country would announce that a war had begun -- and ended. The "breathing space," so dear to England in all her wars and won in this century with such difficulty and sacrifice at the Marne and at Dunkirk, will hardly be obtained in any future national war.

NEVERTHELESS, any future war will probably be won from the air. This fourth distinctive feature of any future war would not seem to be a fundamental difference from the last war. But the difference will lie in the *nature* of the aerial warfare. The last war was by no means won by the air forces alone. But in any future war the air forces will probably strike the *decisive* blow, if not the final blow. Secondly, the air attack will not be launched by fleets of heavy bombers protected by an equal number of fighter aircraft. The day of the big bomber is almost certainly over. It will be replaced by the ground-controlled rocket or the fast-flying light bomber. In any case, as far as can be estimated at the moment, the invention of the light and compact atomic bomb has given the air forces a war-winning potentiality totally out of proportion with the powers of the land and sea forces.

Fifthly, a future major war will differ from the last war in its duration. Any future war is likely to be bloody but brief, if only from the extreme violence of its nature. This, admittedly, is a bold claim to make, and likely to be greeted with a good deal of cynicism, because twice, in 1914 and in 1939, has this country heard the confident cry, "Bound to be over by Christmas"; while even Government and official circles only budgeted for a three-year war in 1939. Yet, in total, England has seen ten years of world warfare in this century. Nevertheless, the example of the rapid surrender of Japan in 1945, and even a sketchy idea of the destructive possibilities of atomic warfare, make any prolonged international conflict appear likely to be a physical impossibility if nothing else. Atomic warfare for six years would create the need for a new material world, let alone a new moral world. Extreme violence and widespread total destruction in war bring brevity as their only virtue.

Finally, will any future war differ fundamentally from the last war by not requiring the use of armed forces? Today many people maintain that there is no longer any point in retaining standing armies, since an annihilating and war-winning attack can be launched over the heads of the troops on the ground. The logical conclusion would be, therefore, that all armed forces should soon be largely disbanded.

However, if the problem is reduced to bare essentials, this theory that atomic bombs render armed forces useless is absurd and illogical, because no nation which possesses atomic bombs, or hopes to possess them in the future, will dare to disband its armed forces for that reason alone, since it would thereby lay itself open to armed nations who coveted or dreaded these weapons. If one nation possessed atomic bombs but had no armed forces, then another nation, possibly even a small nation, could land easily on the former's territory, capture its atomic bombs, occupy or destroy its atomic plants and leave the invaded country utterly helpless. Armed forces, then, are required to protect atomic bomb sites, dumps and plants, and all other war material situated in the country. Secondly, armed forces are essential to ensure that a nation can employ its atomic weapons to the greatest advantage. This would probably mean the nation's armed forces attacking, seizing and occupying a piece of intervening alien territory which provided suitable bases for bringing the various installations of aggressive atomic attack within closer range of the enemy's territory. It would also tend to divert the enemy's projectile attacks away from the home cities on to the newly seized territory and bases. The atomic bombs on Hiroshima and Nagasaki brought the Japanese war to an end. But the final war-winning blows were preceded by many months and years of heavy land, air and sea fighting in the slow approach towards strategical bases within air range of Japan. Too much should not be deduced from these events; but we may at least expect some strategical manœuvring by combined forces to secure the optimum offensive bases.

For several vital reasons, then, national armed forces are still required.

# Airman's Reading

America and War, by Marion O. French (Military Service Publishing Co., \$5).

Reviewed by  
Albert F. Simpson

COLONEL FRENCH, a professional soldier for 'almost forty years, has written a unique, interesting, and useful one-volume story of America from 1492 to 1947. The book deals primarily with the wars in which this country has participated, but the author has tried to tie into the military story some of the internal political, economic, and social factors and some of the external forces which have influenced American history in general and American military history in particular, and has endeavored to present the causes of our wars and the results which came from them. Therein lies the book's major weakness: it undertakes to tell a story that is far too large and complex to be told in a single volume; consequently, it lacks depth, fullness, and perspective. *America and War* is precisely what the word "Record" in the subtitle indicates that it is: a chronicle of events, a parade of facts--thousands of them--chronologically arranged and simply presented.

All of this does not mean that the book has no value. On the contrary it is an extremely useful document. For one thing, it is an excellent reference work; its first-rate index will enable the user to put his finger quickly on any one of hundreds of military events, even though he must look elsewhere for the full details. It is good to have a running account of our military history in a single volume. For another thing, the author has done a neat job of mentioning the small (and usually forgotten) military events, the strength of the armed forces from time to time, the leaders of the Army and Navy, and the inventions and developments which have influenced modern warfare--all of which are part

and parcel of the American story but are not included in the usual history. Thirdly, there is a 28-page appendix entitled "Conduct of War." Consisting of three parts--Governmental Strategy for War, Military Strategy for Operations, and Military Tactics for Combat--it is a keen, intelligent statement of the basic principles which underlie modern warfare. Finally, by emphasizing the story of our military operations the book may awaken its readers to the seldom appreciated fact that war has been more the rule than the exception in the life of this nation--which, in terms of the future, would be a very great service.

It is unfortunate that the book suffers from a number of minor errors. There is no excuse for twelve or fifteen misspelled words, a sentence split in half by the title of a subsection (p. 211), and the astonishing sentence "Foch concurred in the Amiens to the English Channel and have served the British from the French" (p. 363). There are a few non-typographical errors, such as: Plymouth is not in South Carolina (p. 249); Pershing was not a brigadier general until 1906 (pp. 337, 338); the Fifteenth Air Force was not established until 1 November 1943 (p. 440). One might also quarrel with some of the author's generalizations. For example: the statement that in 1861 the South embarked on a war "to be waged by a governing class" (p. 188) and that the South was "foredoomed to defeat" (p. 195); and the implication that Germany was fully responsible for World War I (p. 348, 349). And one keenly regrets the absence of maps.

In spite of these faults, *America and War* is still a very useful addition to the military library.



West Point; *The Key to America*, by John Crane and James F. Kieley (Whittlesey House: McGraw-Hill, \$6).

Reviewed by  
Colonel Curtis R. Low

**J**OHAN CRANE and James F. Kieley have provided in *West Point* a lively and engrossing study of the Military Academy from its inception to the present. The authors make a formidable team, each being well qualified for a volume such as this. Mr. Crane is a writer and publisher of numerous

works on American history, including the *American Patriot* series and the *American War Leader* series, while his partner, Mr. Kieley, is a public relations expert with many years experience in journalism and government.

This is a history beginning with the post-revolutionary period. It was in those early days that the need for a national military academy was stressed by such leaders as George Washington. Indeed, it was Washington himself who, on his death bed in 1799, wrote, "The establishment of an Institution of this kind...has ever been considered by me as an object of primary importance to this country." General Knox, then Secretary of War, believed that "Either efficient institutions must be established for the military education of youth...or the militia must be formed of substitutes..." These phrases can be construed as our first recommendations for universal military training.

There were others--generals and statesmen alike--who recognized the necessity of having an up-to-date institution for the primary purpose of teaching men to wage war, realizing that military science, like any other subject, cannot be learned overnight even though an individual may possess all the attributes of a good leader.

With the establishment of West Point this garrison on the Hudson River became a place of strategic importance to the struggling young nation. It was a bulwark of communications defense, as Gibraltar and the Panama Canal were later.

The authors, in the interests of clarity, have divided the text into nine chapters, each dealing with a specific part of Academy history and function. These breakdowns include its educational system, combat training, cadet life, and West Point at war. Detailed accounts are provided.

At the Point observance of the "honor code" is emphatically stressed, for in the final analysis this pattern of living is the cornerstone of character. Every man is expected by preserving his own honor to uphold the "honor of the Corps untarnished and unsullied." He cannot escape his duty or responsibility by deception, making excuses, quibbling, or resorting to technicalities. The honor system of West Point and its practice by officers throughout their careers has helped give the Army its reputation of high integrity.

Academy graduates will be especially attracted to this publication as will those who are desirous of better appreciating this component of our country's military strength. Of particular value is the excellent selection of photographs and prints.



The Calculated Risk, by Hamilton Fish Armstrong (Macmillan, \$1.50).

Russia's Europe, by Hal Lehrman (D. Appleton-Century, \$3.75).

Reviewed by  
Olivet H. Townsend

**N**EITHER of these books can be described as required reading for the military airman. They do, however, constitute excellent supplementary reading for officers who, because of their assignments or interests, are attempting to keep themselves informed about developments on the international political stage, upon which armed forces are so frequently required to play the decisive role.

The two books present vivid contrasts in their approach to foreign affairs. Mr. Armstrong is an editorialist; Mr. Lehrman is a reporter. Mr. Armstrong presents his analyses in a compact, beautifully-written package, somewhat condescending in style, and slightly over-simplified in content. Mr. Lehrman's book, by contrast, is rather long and unorganized, but unmistakably carries the impact that can be achieved only by a man who has been to the places and seen and done the things he writes about.

In *The Calculated Risk*, Mr. Armstrong actually discusses two calculated risks having to do with what he describes as "the two main objectives of American foreign policy today." Objective One, according to Mr. Armstrong, is to help Europe live, because "until Europe's people have found ways of living, they cannot decide upon ways of life." His answer to this is the Marshall Plan, supplemented by a vigorous information and educational program directed at Europe, and backed by taxes, bond issues, and rationing in the United States. He concedes that the Marshall Plan will involve risks, but contends that it is safer than any alternative

plan, and infinitely safer than inaction. His arguments are logical and weighty, but they will sound a trifle pat and familiar to anyone following the ERP debates in Congress.

Mr. Armstrong's Objective Two is to strengthen the United Nations. In this case his proposal is more original. In summary, it is this: "That a group of UN members enter into a brief supplementary agreement, binding themselves to carry out the Charter obligation to resist armed attack. This agreement would be worded so as to come into operation: 1, if two-thirds of the signatories decided that collective action was called for under the Charter; and 2, if the Security Council failed to act." This would, of course, make it possible for the signatory nations to take concerted action in regard to defense without being subjected to the obstructionism of the veto. The proposal, similar to that adopted by the American Republics at Rio de Janeiro in 1947, is now widely referred to as the "Armstrong Plan," and has already received much favorable comment from people in high places, including Senator Arthur Vandenberg.

Turning from Mr. Armstrong's book to Mr. Lehrman's *Russia's Europe* is like walking out of the cloistered, dispassionate atmosphere of a classroom into the turmoil and realities of the market place. Mr. Lehrman has lived through the things he writes about, and what he writes about is tremendously interesting--the blacked-out lands behind the Iron Curtain. What makes his story even more interesting, and convincing, is the fact that, as a thorough-going liberal, he entered Russia's Europe sincerely expecting to be favorably impressed. Instead, he was rudely disillusioned. He found Russia's foreign policy to be one of old-fashioned imperialism, and her domestic policy in the satellite countries to be one of totalitarianism in the most reactionary and stifling sense. He supports his conclusions with scores of personally-observed examples of tyranny and terror in the "democracies" of Eastern Europe.

Mr. Lehrman concludes his book with a call to all true liberals to lead the battle against totalitarianism everywhere. "Genuine liberalism," he says, "did not work in the mornings, when rightists' sins were up for flagellation, and take the afternoons off when it was the Communists' turn.

There was no double standard for slavery." He asks for an end to the appeasement of Russia, which he describes as the principal reason for Eastern Europe's present predicament, and makes a strong plea for the United States to make a real effort to find and support the truly democratic elements in Greece, Turkey and the other European nations still outside the Soviet sphere.



The Armed Services and Adult Education, by Cyril O. Houle and Others (American Council on Education, \$3).

Reviewed by  
Henry E. Patrick

THE AIMS of the off-duty voluntary activities provided during World War II for members of the armed services were, to all intents and purposes, identical with the aims of civilian programs of adult education carried on in a multitude of forms throughout the country. For this reason, the Commission on Implications of Armed Services Educational Programs of the American Council on Education requested the authors of this volume to determine whether these programs have anything to suggest for advancing adult education in America.

Following an excellent account of the history and purposes of armed services educational undertakings, the study analyzes the personnel and organization of the programs carried on during the war by the Army (including the AAF), Navy, Marine Corps, and Coast Guard. The bulk of the volume is devoted to a description of the correspondence study program (principally through USAFI, which enrolled more than one million students); the program of direct individual and group instruction; the Army post-hostilities schools; the orientation, information, and guidance programs of all the armed forces; and the library services and literacy training programs of the Army and Navy. A survey of investigations and evaluation which were conducted by the services themselves is also discussed.

Two important circumstances influenced and, to a great extent, limited the study. First, only *positive* implications

have been stressed; weaknesses are neither appraised nor pointed out. The success of the programs, if judged only by the variety of activities and the number of people who took part in them, was too great to measure by any previous standards. The authors record with some feeling that "if there had been more enthusiastic encouragement and material support both outside and inside the armed services, the off-duty programs might have reached larger numbers of interested service personnel, and their broad objectives might have been more fully realized." Sympathetic commanders and interested individuals at many levels were often personally responsible for the success of local programs; the reverse, of course, was all too often true.

The fact that the study was undertaken after the war was over, when many of those who had been active in the direction of off-duty educational undertakings had left the service, was a second limitation of the study. As a result, most of the evidence had to be secured from documents and from personal testimony obtained long afterwards. Furthermore, programs which were developed and operated--often with outstanding success--under field conditions and in local areas could be studied only through inadequate records, if any existed.

Because the opinions of those who had participated in the many phases of the programs vary from enthusiastic approval to wholehearted condemnation (for a variety of reasons, both good and poor), the fifty-one implications of the study are presented as hypotheses rather than as guiding principles. Teachers and administrators at all levels of education may profit from analyzing and evaluating the orientation and guidance activities described, the way voluntary students were enrolled, and how their educational potentialities were evaluated. Other implications on methods and materials of instruction, leaders and leader training, and finance and physical facilities give many practical suggestions to those who are concerned with educating adults. The successful experiences of the armed services in these fields could well be investigated by all who are interested in educational progress.

Airport Planning, by Charles Froesch and Walther Prokosch (John Wiley & Sons, \$7).

Reviewed by  
Colonel Thomas A. Lane, CE

THE AIRPORTS of twenty years ago resembled, in a sense, the movies of the same era. Both were pioneer ventures in rapidly developing fields. In airport planning, it was not only the skepticism of engineers about fliers' dreams that retarded construction for the future; there was also a shortage of available cash for land and structures which exerted a restraining influence on design advancement. In comparison with aircraft expansion, airport development has taken only small steps forward, generally lagging behind the needs of the day.

Because of the rapidly changing physical requirements for airports and the new social and engineering problems posed by airport planning, the professional literature in this field has been published principally in periodicals and special bulletins. There has been an understandable reluctance to put into a textbook techniques and procedures which might be antiquated tomorrow.

Although a bibliography of professional papers makes a formidable source of information for the many American businessmen and engineers who have found themselves in the airport planning game, there has been need for synthesis, for a statement of principles and procedures which would constitute a guide to sound planning.

In *Airport Planning*, Froesch and Prokosch have done an excellent job of preparing the needed guide. (They are chief engineer and architect respectively for Eastern Airlines). The text is well organized and the language is clear, concise and as non-technical as the subject permits. The scope of the book is limited to the planning task, and such sections as "Airfield Construction" and "Airport Building Design" are treated only generally and as they relate to the planning function. Stress is laid on the relationship of the airport to the community and particularly to the existing and planned surface transportation systems.

This book is primarily a guide to community airport planners. It is not concerned with the special requirements of military air bases except to warn community planners that available military bases are often unsuited for community use and may prove to be unadaptable even after large funds for alterations and improvements have been expended. Nevertheless, many of the principles expounded have full or modified application to military air installations.

The authors have drawn some significant conclusions: The development pattern of personal aircraft is pretty well defined and airport requirements for these craft can also be defined; transport plane developments have pushed airport expansion to the limits of practical economy and planes must now be designed to operate from the modern airport.

These factors would augur stability in the airport planning business. It remains for the future to prove or disprove them.



The Marine's War, by Fletcher Pratt (Wm. Sloane Associates, \$5).

Reviewed by  
Colonel Wilburt S. Brown, USMC

THIS IS a valuable history by a qualified and well-known military historian, Fletcher Pratt. The Marine Corps did well to secure his services. In his foreword Mr. Pratt admits surprise that, although originally guaranteed, the Marine Corps gave him a free hand with all Marine, Navy and captured Japanese records, as well as opportunities to interview what eyewitnesses he desired. All this was given without any attempt to censor the result. He correctly states that the record of the Marines in the Pacific is so proud that they can afford to admit whatever errors were made.

Certain minor errors are apparent, and other reviewers will perhaps detect more, particularly in actions in which they participated. That is natural and unavoidable. Where there are two or more versions the historian must choose one to record. Even so, there are fewer inaccuracies here than in such recently published histories as *Admiral Halsey's Story*.

The author does not whitewash anyone, nor does he pillory anyone. Pelelieu is described as the hardest battle of the Pacific. He notes, but does not sufficiently stress, the reasons why it was so tough. It was because the First Marine Division did not get an opportunity for proper training during the interim between Cape Gloucester and that action, and because in spite of all that Admiral Connolly had demonstrated at Roi-Namur and Guam as to how naval gunfire could be used to spare landing casualties, it was not so used at Pelelieu. Again at Iwo Jima Pratt skeptically accepts Kelley Turner's explanation of why the Marines could not get the preliminary bombardment they knew was necessary. The explanation is quite specious, for if Connolly had been in Turner's place the Marines would likely have had what was needed.

One shortcoming of the history is the absence of a record of Marine Aviation throughout the Pacific. That story needs telling by a historian of Mr. Pratt's caliber. Marine Aviation came out to support the First Division at Guadalcanal in 1942 and stayed in the Solomons for about two years. Marine aviators received flight training in the States during that period, but they learned gunnery the hard way--shooting at live Japanese airmen. Losses were heavy, but they shot down an average of better than ten Japs for each of theirs. And they were fighting the best the Emperor had to offer. Our successes at Tarawa, Kwajalein, Eniwetok and the Marianas would have been far more costly were it not for the Leathernecks' sustained destruction of the enemy air arm in the Solomons. There were Army and Navy aviators in that show too who deserve great credit, but it should not be forgotten that Marine Aviation literally threw everything it had into the attack. It had the lion's share of the work and deserves a proportionate amount of the credit.

It is regretted that, amidst this record of heroic action, a few pages were not devoted to the men of those defense and airdrome battalions whose casualties came from tropical diseases and "cafard", contracted during the first half of the war while building defenses against attacks that never materialized. These units were formed of excellent men, all of whom enlisted immediately after December 7, 1941. They

drew a most inglorious, hard and lonely assignment. Most of them who did not succumb to malaria or elephantiasis finally did see action toward the end of the war.

Otherwise, the history is essentially accurate and very well done. Both Navy and enemy reactions, plans, and operations are discussed to shed light on Marine Corps activities. It will be a source book of history, the most objective evaluation of the Marine's war that has appeared to date. The military scholar cannot fail to see that division and higher echelon leaders in many cases showed a sad lack of comprehension as to the use of large units of combined arms, and that the Naval commanders' influence on the military scheme of maneuver was too great and frequently a handicap to the ground commanders.

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Battle for the Hemisphere, by Edward Tomlinson (Scribners, \$3.50).

*Reviewed by*  
Aubrey H. Starke

MR. TOMLINSON'S readable survey of what is happening politically in South America is a good introduction to the study of a problem for which the author suggests no convincing solution. Granted that communism is as strong in South America as Mr. Tomlinson says it is; admitted that the Peron regime in Argentina is totalitarianism of the Nazi type, with international ambitions; admitted also that the democratic and republican tradition still persists in countries which have not yet lost their democratic forms of government but only their civil liberties--will the Good Neighbor policy and "a new, redeemed...a firm, respected Dollar Diplomacy" be sufficient in the future "to allow our democratic neighbors in Latin America to free themselves from generations of political and economic oppression?"

It is the first two-thirds of this book that will be of most interest to Air Force readers. Mr. Tomlinson gives some important facts about the strength, nature and successes of communism in Latin America. He has an accurate understanding of the importance to the United States of the natural resources of this "Other America" as well as a clear grasp of

the strategic importance of the continent in a global war in which Russia might be our adversary. (See especially pages 94-98). Hitler tried to create "Another Germany" among the Germanic settlers in South American countries; Russia, according to Mr. Tomlinson, is trying to create "Another Russia" among the numerically greater Slavic settlers there. Mr. Tomlinson also recognizes something that was not always clearly understood in the early days of Mussolini and Hitler, that some of the forces which are supposed to be battling against communism are just as dangerous as communism itself.

The author is no interventionist. He believes that the people of an affected country should be given full opportunity to make their own decision, and assisted only in ways recognized by international law to rid themselves of a dictator. He condemns the "contradiction of policy" that permits the United States to support such a totalitarian dictator as Trujillo in Santo Domingo while attempting to eliminate or curb Peron in Argentina, and to insist on free elections in the liberated countries of Europe while tolerating manipulated elections in South America. Moreover, he condemns "the plan conceived by the Truman Administration, calling for the 'standardization of military equipment in the other American Republics.'" But so convincing is the first part of this report on the cold war going on for control of South America that the author's homiletical comments on United States responsibility and his optimistic report on the current status of democracy in the countries to the south seem a little unexpected. If the situation is as grave as Mr. Tomlinson makes it seem, the solution of the problem cannot possibly be so easy.

It seems to be the author's belief that "the onward march of totalitarian Communism" must be halted in South America by intensified United States effort. It would seem more realistic, however, to make the intensified effort in Europe, where the march began. If strong democratic nations come into existence there, we shall have created a moral force that may halt the march everywhere. Then the march itself may become a rout.

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U. S. Naval Logistics in the Second World War, by Duncan S. Ballantine (Princeton Univ., \$3.75).

*Reviewed by*  
Lt. Col. Harry A. Sachaklian

**P**URPORTING to deal with "that limbo between factory and beachhead in which economic and military considerations are inextricably woven together," this volume falls short of its potentialities. Had the author carried out his announced purpose the book would have been of inestimable value to military and civilian groups concerned with the problems of war. It is unfortunate that this account is primarily a record of the organizational wrangles within the Navy Department over questions of logistics supervision and control. As a result it is more concerned with administrative than logistics problems.

In spite of this, there is pertinent material in the book. There is a remarkable similarity between the organizational difficulties surrounding logistics in both the Navy and Air Forces, and some of the comments on the attitude of Navy "line" officers toward logistics as a problem and as a career could very well be applied to Air Force "rated" officers. In addition, there is introduced a field of investigation that might well be adopted by the Air Force. This concerns logistics activity above the level of operational units. Since such activity is a highly intricate and interrelated problem it would appear that strategic and logistical planning should be conducted simultaneously and by the same planning agency. It is pointed out that this was not done by the Navy in the last war, and our experience reminds us that it was not followed by the Air Forces.

This book's principal value is as a reference for the Navy Department. It gives little insight into the actual elements or principals of Naval logistics. Hence, it loses considerable force as a potential basis for solving any overall logistics problems. The chapters "Logistics in Modern Naval Warfare" and "Logistics Lessons of the War," however, are well done and should be read by military personnel.

The field for a standard and acceptable treatise on the theory of logistics is wide open. It is hoped that one will be written soon.

Alaska, Bridge to Russia, by Murray Morgan (E. P. Dutton, \$3).

Reviewed by  
Major Arnold E. McKenzie

THE HISTORY and geography of the Aleutian Islands, their part in the recent war, and their future military and economic possibilities are all briefly presented in this study. The account offers little in originality, either from a historical or scientific viewpoint. However, it does furnish a graphic picture of the area, past and present, that should prove enlightening for those readers unacquainted with the region. A description is given of the almost continuous volcanic activity and its origin, the weather and climate, and the fauna and flora. Also discussed are the culture and welfare of the early Aleutian people and the discovery, settlement and exploitation of the Aleutian Islands and Southern Alaska by the Russians.

History is traced from the year 1581 when Ivan the Terrible forced the Cossack leader, Ermak Timofeev, to flee eastward of the Urals in conquest of Siberia. This was a bloody expedition of murderous plundering. Later, the Cossacks overran Siberia and reached the Pacific in their wide search for fur-bearing animals. In the eighteenth century the Russians made extensive explorations in the North Pacific and Bering Sea and over one hundred years later, in 1867, sold their possessions in America to the United States. Economic strife and political difficulties plagued the area for several years after the purchase.

Analysis of the strategic role played by the Aleutian chain in World War II consists principally of revisions of articles written by war correspondents and military personnel. The future of the Aleutian Islands and the Alaskan Peninsula with reference to their economic and strategic values are discussed in the closing pages. This section also speculates on the stepping stone value of the chain for trans-Pacific air liners between North America and Asia.

Military personnel who someday expect to serve in this theater and all others interested in securing a basic knowledge of the North Pacific should find this book profitable.

Scientific Man vs Power Politics, by Hans J. Morgenthau  
(Univ. of Chicago, \$3).

The Beginning of the U. S. Army, 1783-1812, by James Ripley  
Jacobs (Princeton Univ. \$5).

Reviewed by  
Colonel Charles G. Kirk

MR. MORGENTHAU believes that Western civilization, enchanted by the success of its scientists and the scientific method in solving the problems of the material world, has become the victim of a delusion that the scientific formula can solve all the problems of man. He argues that the "scientism of our age" has resulted in "intellectual confusion, moral blindness and political decay." It is pointed out that we have turned to the panacea of the expert planner and the social scientist to solve problems that require "not the rationality of the engineer but the wisdom and moral strength of the statesman." The author reasons that power politics and the resulting conflicts among men are the essence of human life in society, and that they will not submit to rational control as do the natural sciences. Therefore, they cannot respond to the mechanical formula. As a result, scientific man must give way to the statesman--the man who possesses the moral judgment and strength to choose, among several possible courses of action, the one least evil. Then, a new society in which man's political nature is reconciled with his moral aspirations will be created.

The writer states that his purpose is to call attention to the ill, not to offer a cure. This decision enables him to avoid the monumental task of describing this curative statesman and his required moral stature and ethical code. Or perhaps Mr. Morgenthau does not wish to fall into the social scientist's pitfall by setting up a solution. This is a provocative volume for students of social politics.

*The Beginning of the U. S. Army* is a detailed and scholarly account of the United States Army from its beginning as a force of fifty-five men at West Point and twenty-five at Fort Pitt to the eve of its first conflict with another nation.

Here is the story of an army maintained by necessity, faced with the possibility of aggression from Europe and charged with opening and securing the Western frontier. "Such a difficult and important mission required a large and highly competent force; but the existing one was small, ill-paid, ill-clothed, ill-fed, and often ill-trained and ill-led." These mandates were given by a people to whom a professional military establishment was repugnant and whose fear of military tyranny and love of economy resulted in the growth of the minuteman concept of citizenry. From this concept grew the doctrine of the militia as the nation's bulwark -- so long the basis of our military policy and so costly in time, lives and wealth.

Major Jacobs forcefully demonstrates that an army is the product of the social and political structure which conceives it, making the history of the Army a social history of its period. This Army's character was molded by the settlers along the Ohio and Mississippi Rivers, and by a Congress dominated by states at a safe distance from the turbulent frontier. While this is a textual history, it is so well flavored with interesting documentation and color of the period that readers will find it more vivid than fiction on this phase of American life.



*Air Power does not signify alone the winged might of the Armed Forces. It also means hometown airparks, hundreds of thousands of qualified civilian pilots, swarms of sky-jalopies and the mechanics to keep them purring, big and little aircraft plants, and a younger generation busy learning aviation from the ground up. It means an aviation industry kept alive and ready for emergency expansion by peacetime prosperity. It means an American people who in the air have found another dimension of life.*

-- Robert E. Neprud  
*Flying Minute Men (1948)*

## BRIEFER COMMENT

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**They Tamed the Sky**, by Douglas J. Ingells.

AT LAST the story of Wright Field has been told in one readable volume. This book records the remarkable development of aviation as it has taken place there from the field's beginnings to its present prominence as headquarters of the Air Materiel Command. Pilots and mechanics, aerial engineers and visionaries, sergeants and generals, are among the great names. Here, more than anywhere else, American Air Power has evolved. Although for the sake of continuity the scene shifts to Bolling Field, or Anchorage, or Hickam Field, or Burma, the focal point is always Wright. To the author it is "a virtual Hollywood wonderland of weird noises and fantastic operations. Powerful aircraft engines mounted on test stands cut the air with a throaty roar that vibrates the windows of downtown hotels. A hundred different types of aircraft weave a never ending traffic pattern in the sky... ." There are huge wind-tunnels, square towers for engine testing, giant chambers for simulating high altitude pressures, all humming, clattering, achieving new goals in efficiency, safety, and the conquest of the sky. This is an informative study of the Air Force's primary research and development center.

*D. Appleton-Century \$3.50*

**The Study of International Relations**, by Grayson Kirk.

SIX regional conferences of university and college teachers provided the background for this

book. Professor Kirk of Columbia University has organized this inquiry to provide a comprehensive picture of the present state of the study of international relations in American colleges and universities. The book will be of real value to everyone concerned with this new and rapidly expanding field. Definitions of objectives and how they are to be accomplished will go far toward clarifying thinking on the subject. "No field of human inquiry today is more wide open to future development. None is more challenging, and none could be more important to the survival of human society."

*Council on Foreign Relations \$2*

**Sky Pioneer**, by Robert M. Bartlett.

HERE is an engaging biography of an outstanding pioneer in aviation, subtitled *The Story of Igor I. Sikorsky*. This versatile designer has been making "flying machines" since 1909. The author leads us from Sikorsky's boyhood dreams of things that fly to his currently successful helicopter. In the half-century interim he designed and built hundreds of other aircraft, including the first four-motored plane and the famous Sikorsky amphibians. Set against the background of turbulent Czarist Russia this tale moves, after the first World War, to western Europe and later to America. Igor Sikorsky has high hopes for the future of aviation. This is a light, chatty story of a fascinating personality.

*Scribner's \$2.50*

Atomics for the Millions, by Dr. Maxwell L. Eidinoff and Hyman Richlis.

AS ITS title advises, this cleverly written exposition of atomic energy is for the lay mind. Even so, it requires close attention, and a knowledge of elementary physics is helpful. Highly technical terminology and formulas are stripped from this volume. Gone too is the working language of the scientist. Remaining is a remarkably clear analysis of this much talked of but little understood subject. Most of the book deals with what has already been done, but there is a preview of the future of atomic power. Industry and medicine are two fields which should reap benefits. An interesting account of each atomic bomb exploded to date is provided. The overall result is a satisfactory survey of the atomic field.

*Whittlesey House: McGraw-Hill \$3.50*

Company Commander, by Charles B. MacDonald.

THIS IS a true combat story with intense reader interest. A young captain takes command of a veteran infantry company during some of the toughest fighting in Europe. The men have seen war; their commander has not. Life under fire is vividly described, reaching a climax in the Battle of the Bulge. "This is a personal story, an authentic story. And to make a story of war authentic you must see a war--not a hasty taste of war but the dread, gnawing daily diet of war, the horrors and the fears that are at first blunt testimony that you are a novice and then later become so much a part of you that

only another veteran, through some sixth sense, may know that those same horrors and fears are yet there." Everyone who is concerned with the command of men in battle and every person who would like to know what war and battle and true leadership are will find this a gripping story.

*Infantry Journal Press \$3*

Man's Last Choice, by E. M. Friedwald.

ATOMIC Air Power may well destroy our civilization. Such is the thesis of Mr. Friedwald, a scholar with an international reputation in science and world affairs. This study of "political creeds and scientific realities" re-sounds the familiar tocsin that the potentialities of modern science ensure that a war fought with atomic weapons in the hands of all powers will be a war of annihilation for all powers. World control of atomic energy as proposed by the United States to the Atomic Energy Commission of the United Nations may yet prevent disaster. Of particular military significance are the chapters on "Science and Geopolitics," and "Science, War, and Politics."

*Viking \$2*

Other Skies, by John Ciardi.

"BY AN accident of chaos," the author says, war was the central experience which called forth many of the lyrics in this book. This is a collection of poems by an airman of the war generation. His thoughts, the language and images with which he expresses them, belong to the Air Force we all know. That Ciardi was a

sensitive and perceptive, articulate member of it enhances immeasurably his reader's feeling of shared experience. Many of the poems were written while flying combat on Saipan where "The Innocent keep other skies. We have much to learn." In the Air Anthology section of this issue the poem "Death of a Bomber" from this collection is reprinted.

*Atlantic--Little, Brown \$2*

**Dark December**, by Robert E. Merriam.

THE GREATEST pitched battle on the Western Front in World War II was "The Battle of the Bulge," of which this is the full account. Involving over a million men who fought together in the frozen forests of the Ardennes, this attack was conceived by Hitler himself. This book unfolds the whole dramatic story, from the conception of the plan to the final crumbling of the threat to Antwerp and the apologetic statements to Hitler by the German command. The author has performed a monumental task in the accurate reconstruction of this great battle. Readers will find this a dramatic, authoritative, realistic, and completely absorbing account of one of the greatest military struggles of all time.

*Ziff-Davis \$3*

**The Web of Government**, by Robert M. MacIver.

BASED ON a sociological approach, this is an original analysis of the nature, evolution, and functions of the state--a rigorous

reconsideration of all the assumptions which political analysts of the past have accepted as self-evident. Professor MacIver of Columbia University examines the bases of authority, looking into man's social nature, the myths that guide him, and the necessities of community life, to find the foundations of law and the conditions that favor obedience to the law. He reclassifies the forms of government and shows the roles played in political transition by national revolutions, class revolutions, and quieter processes such as technological advance, economic readjustment, cultural and population changes. "The State as War-maker" is the section of most military significance.

*Macmillan \$4.50*

**Basic Logic**, by Raymond J. McCall.

AS THE AUTHOR of this book states: "If we would think philosophically we must first become proficient logicians... . We must learn to detect beneath the flesh of rhetoric the sinews of argument." Designed to serve as the basis of an introductory course in logic, the present volume presupposes no special classical or scientific training. It presents the fundamental principles in a straightforward exposition supplied with examples at every step, and so lucid that it can dispense with simplifications and schemes which distort the true nature of logic. Topics covered include simple apprehension and term, judgment and proposition, deduction and the syllogism.

*Barnes and Noble \$2*

**Will Dollars Save the World?,** by Henry Hazlitt.

THE QUERY "...is the Marshall Plan capable of success; or is it doomed to inevitable failure?" is a key question of our time. Mr. Hazlitt, an economist of international reputation, digs deep to examine this problem from manifold viewpoints: economic, political, military, and humanitarian. His lucid analysis pulls no punches and each thought presented is backed with hard facts and economic truths. This is a profound and stimulating forecast, simply but expertly written. In the final analysis the fate of the Marshall Plan is certain to affect the political and military strategy of the United States.

*D. Appleton-Century \$1.50*

**The Last Days of Hitler,** by H. R. Trevor-Roper.

IN SEPTEMBER 1945, when the fate of Hitler was causing interested speculation throughout the world, an Oxford historian, H. R. Trevor-Roper was appointed to find and examine all available evidence. The author has used the material gathered to produce this important narrative enacted against a grotesque background--an underground bunker in the heart of Berlin. This book sheds light on many problems besides the original question of Hitler's death: the Plot of July 20, 1944; Hitler's character; his relations with the military; Goering's fall and the intrigues of the high Nazis. Much valuable information is given concerning the top echelon problems of the last days of the German Air Force. To the question "Is Hitler dead?" the author's answer is "Yes!"

*Macmillan \$3*

**Man and The State: Modern Political Ideas,** ed. by William Ebenstein.

COMPOSED of the great statements that have influenced political thinking in the West during the last four centuries, this book is built around the four central ideas that determine political attitudes: the foundations of democracy; anti-democratic thought; capitalism, socialism, and planning; nationalism and world order. Professor Ebenstein has selected materials characterized by freshness and clarity of thought and expression. The selections give an understanding of today's world and its practical problems and a grasp of the issues which will determine whether we are to live in peace or relapse into war. Each chapter is clarified by an introductory statement indicating the nature of the problem and placing the writer in the proper historical setting and perspective.

*Rinehart \$6.50*

**Now Hear This!,** by John J. Motley and Philip R. Kelly.

TWO NEWSPAPER men, one a former naval officer, have teamed up to produce this account of Navy ships in World War II. The authors dug deep in Navy files and emerged with a series of terse, dramatic narratives, one for each of several hundred fighting vessels. Being able to include only a fraction of the total, they have dealt with "representative ships," from 45,000-ton battlewagons to the diminutive LCIs. Fleeting glances are given of the wartime history of such immortal battlers as the *Hornet*, *Saratoga*, *Boise*, *Iowa*, *Enterprise*, *McCalla*, *Bard*,

and innumerable others. Each record is an exciting story in itself.

*Infantry Journal Press \$4*

**Techniques of Observing the Weather**, by B. C. Haynes.

WRITTEN FOR high school and college classes in elementary meteorology and weather observing, this book will also serve the average reader who desires a comprehensive view of the subject. For flying personnel the volume will provide an excellent review. The author has drawn on his extensive experience in the weather observing phase of meteorology to produce a work that is interesting as well as authoritative. Incorporated in it are the techniques associated with the operation of weather instruments developed and refined during and since the war. This is a semi-technical exposition of a complex field.

*John Wiley & Sons \$4*

**Gateway to Victory**, by James W. Hamilton and William J. Bolce, Jr.

REVEALED in this book is the complete, authentic, behind-the-scenes story of the San Francisco Port of Embarkation in World War II. Primary supply port of the Pacific War, the San Francisco POE had the responsibility of funneling thousands of soldiers through the Golden Gate and a parallel stream of tons of military cargo. This is a concentrated glimpse at the logistics of global war. Many fine action pictures provided by the Signal Corps are attractive features of the volume.

*Stanford Univ. \$3*

**The Blue Devils in Italy**, by John P. Delaney.

A UNIT HISTORY of the 88th Infantry Division in World War II, this book is of primary interest to those associated with this organization. The 88th Division played a major role in the battle of Italy, where it was rated by the Germans after the summer of 1944 as one of the best. It was the first of the draft infantry divisions to enter combat on any front. The story is well told and profusely illustrated.

*Infantry Journal Press \$5*

**The New Foundation of International Law**, by Jorge Americano.

DR. AMERICANO has constructed a blueprint for world organization based on the premise that "... man [rather than nations] has become a person in international law." The basis of this concept is the Atlantic Charter. He envisions a world agency "supported by a new international conscience" and composed of legislative, executive, and judicial branches. War would be regarded as a criminal act to be outlawed, and principles such as neutrality and national sovereignty would be eliminated. But the key to successful operation of such an organization, the solution to world salvation itself, is the re-education of the human being. This educational program he proposes is no small matter. It is a broad, intensive platform including the various means of "fortifying men in democratic convictions" and of giving confidence in regard to international action. The author believes man capable of absorbing and properly applying this knowledge.

*Macmillan \$3*

The Foreign Affairs Reader, ed. by Hamilton Fish Armstrong.

TO MARK the 25th anniversary of the American Quarterly, *Foreign Affairs*, Editor Armstrong has selected from the thousand or more articles which have appeared in its pages this group of contributions of permanent historical importance. Each bears directly on the paramount American problem --the education of the people of a democracy for the successful conduct of foreign relations. Each contribution illuminates an essential part of the history of the last quarter century. Together they help explain the crucial situation we face in 1948. In these essays the foreign policy of the United States is clarified and that its nature is of vital importance becomes apparent.

*For the Council on  
Foreign Relations by Harper \$5*

Government Planning, by John D. Millett.

A SYSTEMATIC presentation of planning as a vital phase of government administration has long been needed. Professor Millett's *The Process and Organization of Government Planning* fills this need. The author treats his subject as the process by which we determine objectives, define our immediate needs, and design a course of action. He gives examples of wartime planning such as allocating and equipping troops, and setting and meeting wartime production goals. Points are illustrated with the work of the National Resources Planning Board, especially its work in regard to postwar problems; and with examples of planning in the War Department during the war. Planning, the author feels, is

preparation for action, and underlies all administrative performance.

*Columbia Univ. \$2.50*

Canada: A Political and Social History, by Edgar McInnis.

FROM THE founding of New France to the close of the Second World War this history is a story of "slow and tenacious advance from one step to another along the road to nationhood, the patient evolution of successive compromises in politics and government, the determined conquest of physical obstacles to national economic development." The history of Canada is a study in political survival. Throughout the work of Professor McInnis (University of Toronto) runs the constant effort to reconcile the divergent strains inherent in Canada's position and structure and to harmonize the varied and often clashing forces within the community. The text is enlivened by more than a hundred illustrations.

*Rinehart \$6.50*

History of the 363d Infantry Regiment, by Captain Ralph E. Strootman.

THIS is a detailed, well-edited account of a commendable regiment of the Fifth Army and its dogged struggle against the Germans from just north of Rome all the way up the Italian boot. This was mortal combat against an obstinate enemy, fought in mountainous terrain and under miserable climatic conditions. The accomplishment of the 363d Infantry is adeptly revealed. Dozens of photographs and charts supplement the text.

*Infantry Journal Press \$5*

# AIR MAIL

To The Editor:

An author is not entitled to object to the *opinions* on his book expressed by a reviewer, but I think you will agree that his readers are entitled to an accurate presentation of the *facts*. So I hope you will accord me the space to point out three matters of fact which your reviewer of my last book either obscures or misrepresents.\*

He writes that I "charge merrily through the subject of Atomic Power, Air Power, Naval Power, strategy, tactics, grand strategy and national policy in no less than five small pages..." Far from charging, merrily or otherwise, through most of these subjects, I devote the first two pages to explaining why most of these subjects are not dealt with at all. The remainder of Chapter One is solely devoted to strategy. If the reviewer had given the full title of the book, instead of his own truncated version of it the reason for this dismissal of Atomic Power, etc. in two pages would have become apparent to your readers. The full title is as follows: "STRATEGY AS EXEMPLIFIED IN THE SECOND WORLD WAR. A strategical examination of the land operations." And underneath: "The Lees Knowles Lectures for 1946." These lectures, I should explain, are an annual

\**Strategy in World War II*, reviewed by Lt. Col. Jesse O. Gregory, CAC, AIR UNIVERSITY QUARTERLY REVIEW, Vol. I, No. 3, p. 108.

fixture at Cambridge University, given each year on a pre-arranged subject, and limited to four lectures of under one hour's duration. This fact answers the second misconception of your reviewer, when he suggests that I should have done better to give a detailed discussion of one or two campaigns instead of dealing with all of them. Possibly: but unfortunately that was impossible, for my terms of reference were to deal with ALL the campaigns. Consequently I could only devote a few pages to each campaign, and the analysis of each was necessarily brief.

In the third place, he quotes me as saying, "From my point of view there are two and a half rather than three services," and he remarks: "The half service he refers to is the Air Force when employed in *tactical* operations." He should have written *strategical* not *tactical*, as he would have done had he read carefully. For the passage in question is as follows: "The other half of the Air Force--the strategical part--carries out strategical bombing, which could more correctly be called *logistical* bombing, for its main function is to reduce and retard means of supply and communication. This has its *ultimate* influence on the general strategy, but only inasmuch as it affects the logistical factors on which the strategy is based."

Lt. Col. Alfred H. Burne, D.S.O., R.A. (ret.)

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# THE CONTRIBUTORS

*Maj. Gen. Oliver P. Echols*, USA (Ret), President of the Aircraft Industries Association, as Chief Engineer of the Engineering Section, Wright Field, greatly aided in developing the B-17 and B-24; during the war he had a major role in the AAF's part of the planning and expansion of American aircraft production. . . *Col. Cecil E. Combs*, Ass't. Chief, Plans Division, Directorate of Plans and Operations, the Air Staff, until recently held a similar post on the War Department General Staff; he commanded the India Task Force, the 19th and 7th Bomb Gps., and was Deputy Commander, 58th Bomb Wing. . . *Thomas C. Blaisdell* (Ph.D., Columbia), Director of the Office of Int'l. Trade, Dept. of Commerce, previously has been Director, Planning and Statistics, Office of War Mobilization and Reconversion; and Ass't. Director, Nat'l. Resources Planning Board. . . *Lt. Gen. E. R. Quesada*, Commanding General, Tactical Air Command, is widely experienced in tactical air operations; in Africa he commanded the 12th Fighter Command and was Deputy Commander of the NW African Coastal Air Force; in 1943 he took command of the 9th Fighter Command, England, then directed the 9th Air Force fighters in Europe; at war's end he commanded the 9th Tactical Air Command. . . *Maj. John J. Driscoll*, Instructor, New Developments Division, Air War College, as Chief of the Air Weapons and Tactics Branch, Military Analysis Division, U. S. Strategic Bombing Survey, studied the final German and Japanese air weapons and interviewed personnel concerned with their design and employment. . . *Col. Thomas E. Moore*, Ass't. Commandant, Keesler Air Force Base, in charge of Technical Schools, a recent graduate of the Air Command & Staff School, was wartime Deputy Chief of Staff for Operations, 58th Bomb Wing, and Deputy Commander of the 16th Bomb Wing. . . *Maj. Gen. David M.*

*Schlatter*, Deputy Commanding General (Education), The Air University, has previously been Deputy Senior Staff Officer and Chief of Operations, Hqs., AEF; Deputy Chief of Air Staff and Commanding General, U. S. Air Staff Component, SHAEF; and Deputy Commanding General of the USAF in Europe. . . *Albert F. Simpson* (Ph.D., Vanderbilt Univ.), former AAF historical officer and college professor, is Chief Historian of the USAF. . . *Col. Curtis R. Low* (USMA, 1937), Director, Associate Course, Air Command & Staff School, served with the 9th and 12th Air Forces and on the Joint War Plans Committee, Washington. . . *Oliver H. Townsend* (M.A., Univ. of Cincinnati), former technical editor of *Air Force*, is with the Directorate of Public Relations, Hqs., USAF. . . *Henry E. Patrick* (M.A., Univ. of Chicago), member of the Educational Advisory Staff, The Air University, was formerly on the faculty of the Univ. of Chicago. . . *Col. Thomas A. Lane*, Chief, Logistics Division, Air Command & Staff School, a member of Gen. MacArthur's wartime staff, before the war was with the air engineering section of Hqs., AAF. . . *Col. Wilburt S. Brown*, USMC, Instructor, Naval Division, Air Command & Staff School, was wartime commander of artillery, 1st Marine Division. . . *Aubrey H. Starke* (M.A., Harvard), former statistical control officer, 9th Air Force, is with the Directorate of Public Relations, Hqs., USAF. . . *Lt. Col. Harry A. Sachaklian*, Instructor, Logistics Division, Air Command & Staff School, was wartime Air Logistics Member of the Joint Plans Staff, Allied Force Hqs. . . *Maj. Arnold E. McKenzie*, project officer of the technical section, Evaluation Division, the Air University, was Chief of the Weather Research Center, 7th Weather Group, Alaska. . . *Col. Charles G. Kirk*, Air War College student, served in the ETO with the 8th Air Force as Assistant A-3, VIII Bomber Command.

## **THE AIR UNIVERSITY COMMANDANTS**

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