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**QUARTERLY REVIEW**

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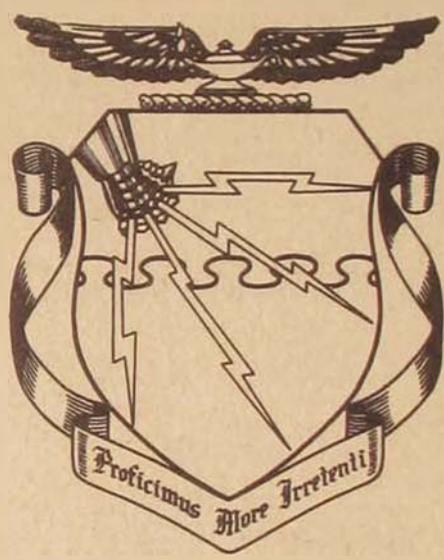
WINTER 1947

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# AIR FREEDOM

*Colonel Noel F. Parrish*

**A**MERICA requires a new and positive doctrine to replace old and negative doctrines which are no longer adequate. The doctrine proposed is "Air Freedom."

There is ample precedent and justification for American support of the principle that all the air shall be free to all nations. The proposal is neither as new nor as difficult as it may at first appear.

Air Freedom is the logical and inevitable extension of the historic doctrine of freedom of the seas which was so important to the existence of the young American nation that sea wars against Tripoli, France, and England were fought to uphold it. Air Freedom is now as important to the prosperity and security of this nation and all nations as ever was freedom of the seas during the long struggle for its universal acceptance.

Air Freedom means simply that the air and space surrounding the earth is admitted to be free and unrestricted to the use of all men and nations capable of using it, provided only that their use of air and space does not directly damage other men and nations. This doctrine is opposed by the doctrine that "each nation has complete and exclusive sovereignty over the airspace above its territory."

The phrase quoted appeared in an international agreement signed in Paris in 1919. Though this agreement was never ratified by the United States, the statement came to be generally accepted as a principle of international law, and it has been copied into two subsequent international agreements involving the United States. Thus it has precedent, and as long as it continues to be accepted by a considerable number of nations, it has force. But this circumstance does not mean that the matter is settled for all time, either in theory or in practice. New agreements may be reached. Single nations may legally denounce previous agreements under the terms of those agreements. The gates on airspace are not

locked. In actual fact they have never been closed, because they have never existed except in imagination.

In the sky there is neither land nor sea, neither island nor continent, neither nation nor territory. There is only boundless and limitless space. No nation has ever owned it or policed it or controlled it. No nation ever can.

Long ago the nations of the earth gave up the pretense that they owned portions of the open sea. The proud Romans once thought they owned the Mediterranean. "Mare Nostrum," our sea, they called it, and because they controlled all its shores, the title made sense, even though historians cite it as evidence of arrogance. The open seas beyond the African coast, the Romans were content to leave to the Gods.

After the voyages of discovery these open seas became avenues of commerce. Nations, especially seafaring Portugal and Britain, began to claim more and more of the open sea, and to seize the vessels of peaceful nations daring to use it for passage. This led to a kind of international piracy which threatened the existence of world commerce and trade. It was inevitable for a nation to attempt to blockade or destroy another nation's shipping when at war, but when nations claimed the right to close portions of the sea to all other nations in peace, they threatened world commerce and civilization with stagnation and decay, in much the same way that the recognition of mutual air blockades restricts the development of world air commerce today.

**A** DUTCH SCHOLAR, Hugo Grotius, stated the case for civilization, and incidentally for Holland, in his celebrated exposition of the doctrine of "Mare Liberum," the free sea. His thesis was that it was unjust as well as impossible for any nation to claim the sea, which it could not occupy, and to deny its use to others seeking only the privilege of travel and trade. No nation, he said, could justly presume to interfere with the trade between two other peaceful nations by pretending to exercise "exclusive sovereignty" over fathomless water. His arguments were not immediately greeted with cheers by those nations which hoped to profit individually by allocating among themselves the entire surface of the earth. A British lawyer replied to Grotius by

trying to justify the opposing doctrine of "Mare Clausum," closed sea. The dispute continued for years, but the doctrine of "Mare Clausum" and its proponents were eventually forgotten while the open sea has served all nations and all mankind for more than a century.

It was inevitable that nations capable of international leadership would finally recognize that trying to fence off for themselves portions of the globe which they could not occupy or completely use was far less profitable in the long run than agreeing with other nations to use such areas for the common benefit of all.

The attempt to claim dominion over the seas is now considered a part of the selfish short-sightedness of a previous age. Great Britain, at the height of her sea power in the century following the Napoleonic Wars, might well have claimed control of all the seas, but instead kept the seas open to the trade of all peaceful nations, for the reason that this was more profitable for all the world, and the world included England.

This was the "Pax Britannica" of the victorian era, which produced perhaps the greatest spread and advance of civilization since the centuries of "Pax Romana" kept the Mediterranean open for the development of the civilization of the ancient world.

The one hope for another great period of peaceful advance in world civilization lies today in the beginning of a "Pax Aeronautica," or Air Peace, based on the cooperation of the nations of the world to free and use the air for the benefit of all.

There is no choice except that between air war and an air peace. The truth is plain that if civilization survives at all, it will survive under a "Pax Aeronautica" imposed over all the world by some nation through conquest, or accepted under the leadership of some nation through cooperation. The only nation today which is capable and disposed toward such leadership is the United States.

**SHOULD** the United States propose, as a matter of world policy, to guarantee the freedom of the air above all nations desiring peace, for the use of all peaceful nations, through

the cooperative use of its commercial air services and under the protection of its military Air Power, peace-minded nations would have everything to gain and nothing to lose by acceptance of the doctrine of Air Freedom. We now cover this hemisphere and encircle the world with our air transportation service, but this is only a hint of the extent of service required to knit the world together today, and only a beginning of what could be accomplished if international restrictions and imaginary sky boundaries were removed. Landing rights, employment of other nationals, assistance in the development of domestic lines in other nations could of course be provided by agreement to the great benefit of our own air industry and the internal economy of the other nations. Those nations attempting to hold out or bargain unreasonably could simply be flown over at altitude, under the principle of Air Freedom, and ignored as towns were once ignored when they refused admittance to railroads, or seaports when they restricted shipping, and so allowed to decline in isolation. Few nations would long hold out. The advantages of Air Freedom are too great and the disadvantages of attempted restrictions are too obvious.

The Marshall Plan, which no free nation has refused, is intended primarily to restore damaged countries. The Air Freedom plan would be an invitation to participation in world progress.

Great Britain gained leadership in sea power partly through conquest, but she maintained it largely through cooperation. She maintained leadership by being able to build ships and haul cargoes more efficiently and hence more cheaply than others. She maintained it by new doctrines, new efforts, and a capacity for daring leadership in taking full advantage of her technical pioneering in the industrial revolution.

A British ship, war or merchant, was a package of technology. It was not only impressive in appearance, it could, through its technical superiority over everything else, do the things less fortunate peoples always admitted, eventually at least, they wanted done. It could guarantee security, protect trade and traders, and transport and provide those articles which are the basis of the modern civilization and

progress which all nations now desire. Thus industrial civilization was spread around the coastlines and through the ports of the world. Thus Britain brought the seacoasts of the world together in trade and contact profitable for all. But industrial civilization has spread beyond the seacoasts now, and only Air Power can reach out to knit it together.

As Britain led the industrial revolution, America leads the transportation revolution. The American airplane is a package of technology as revolutionary as one of Her Majesty's ships in the days when sea power provided and protected the best means of communication. American air communication has already become indispensable to nations of the Western Hemisphere, despite the limiting restrictions under which the closed airspace principles have forced it to operate. It could quickly become much more useful and much more available to all the world's peaceful nations under the doctrine of Air Freedom.

Such freedom includes freedom of competition, which has some disadvantages, particularly to our internal economy where we like to keep our own dominance unchallenged. But trade, by definition, is reciprocal. If we haul for and over other nations, we must grant them the privilege of hauling for and over us. We are already doing this under numerous bilateral agreements which were necessary in order to establish our present air commerce. Many other nations now have the right to fly commercially across the United States and some are already planning routes.

**T**HE RIGHT TO FLY or trade is either exclusive, which would destroy all world air commerce; reciprocal, by agreement between two nations (bilateral); or general, by agreement among many nations (multilateral). The present bilateral system, as was suggested in the magazine *Air Affairs*, by Mr. Oswald Ryan, Vice Chairman of the CAB, has many disadvantages for "a great trading nation that desires to have broad commercial relations throughout the world." Under this system each nation, no matter how large, secures flight and commerce privileges equal to those it grants and is thus encouraged to try to develop airlines and services to take advantage of the privilege for which it has bargained. On the other hand,

"freely according such rights to all contracting nations satisfies the requirements of national prestige without giving comparable incentive for the overdevelopment of international services."

This line of thought indicates that broad, general freedoms are not likely to produce more competition for United States air transport services than a multiplicity of individual privileges such as we have granted in the past.

Together with other nations, we have granted freedom of our seaports for a century and a half, in order to gain access to the more numerous free ports of the world. With our present air leadership, if we cannot continue to meet competition through expansion instead of restriction, we are doomed as a world air power. Air Freedom, like freedom of the seas, does not keep out all foreigners. But far more than seafreedom, it opens to us the world.

United States policy has recognized this, at least to a degree, for the past twenty-nine years. Since the end of World War I we have negotiated almost constantly for greater freedom of the air, and with very limited success. Pan-American Airways found it necessary to instigate the accomplishment of some sixty separate international agreements in the space of ten years in order to extend air lines to South American countries, and these agreements, though presently workable, leave much to be desired. The difficulties of working out such a complexity of negotiations on a world-wide basis, nation by nation, are depressingly obvious. The necessary time factor alone appears capable of defeating our purposes unless we embark on a positive, world-wide program with a generally acceptable purpose such as that contained in the doctrine of Air Freedom.

Our greatest achievement toward broadening the right to fly on a world basis was produced by the Chicago Convention on International Civil Aviation in 1944. Although considered a failure, this conference did result in some minor agreements, one of which, the Transit Agreement, appears to free a considerable amount of airspace by an exchange of flight privileges among twenty-nine nations.

Mr. John C. Cooper, an experienced authority in the field of air law, analyzes the limitations of the Transit Agreement

in a treatment of the airspace problem contained in his recent book, *The Right to Fly*. According to Mr. Cooper, the Transit Agreement is "not now an adequate part of world organization. It has been accepted by twenty-nine nations, including the United States and Great Britain, but not yet by certain other important world-route nations such as France, Ireland, Brazil, Egypt, and Portugal. As it can be denounced on one year's notice by any one nation, it is not a basis for permanent routes."

The principal clue to the unsatisfactory nature of the Transit Agreement, as well as all international air agreements yet proposed, may appear in Mr. Cooper's observation that the Transit Agreement authorized "certain privileges, not rights, of flight over and landing for refueling in the territory of accepting nations . . . . Fundamentally, therefore, the legal position since the Chicago Conference and World War II continues as before."

**N**EGOTIATING for *privileges* rather than *rights* has invariably proved inadequate. The world air situation, under the system of bargaining for a thousand separate *privileges* of flying through half a hundred theoretically separate airspaces, is in the primitive condition of the world sea situation more than two centuries ago. Then, nations had to bargain separately for the precarious privilege of provisioning at another nation's port or even sailing across the open sea through some other nation's presumed "sovereignty." The United States called this an interference with *rights*, not "privileges," and denounced and fought the Tripolitans as "pirates" when they interfered with these rights. The United States later led in securing for all nations the right to freely navigate the St. Lawrence, the Amazon, and certain other great rivers of the world which lead far into the interiors of nations. That the United States and Great Britain, the historic builders of free world commerce along with other cooperating nations, should deliberately frustrate the common exploitation by all nations of the world's most unlimited resource, airspace, and haggle interminably over pretended "sovereignty" and legalistic "privileges" just for the common use of unlimited space, which should above all be

free, is one of the saddest fiascoes of modern times.

It seems incredible that the world's great minds should completely ignore a model of world policy which has functioned as an indispensable element of industrial civilization for a century. The freedom of nations to trade with each other without interference from other nations is so fundamental a requirement for the development of civilization that its interruption by war has proved to be one of the major catastrophies of war. It is generally recognized that only by the reestablishment of this freedom of intercourse can the damage of war be repaired and progress resumed. How can intelligent, well-meaning men ever support a presumptuous theory concerning the greatest of all trade mediums, the air, which would encourage nations to blockade each other constantly by theoretical means more effectively than they ever could in war?

Even the most cooperative nations suffered from this divisive theory. The highly important establishment of an airline from the United States to Alaska was delayed for years by failure of the United States to secure the political privilege of flying through Canadian space, although such flights would obviously have benefited both countries. If the doctrine of the "closed sky" can be so damaging in its application to two nations as close and friendly as the United States and Canada, its costliness to all nations is beyond estimate.

In the face of such obvious penalties, what influence has caused men of responsibility to cling to this theory? What has prevented modern men from thinking about the air as realistically as their ancestors thought about the sea? What is the secret of this world-wide reversal of logic and paralysis of purpose which has sought to restrict the space above the earth more completely than its surface?



*During this epoch the destinies of all people will be controlled through the air.*

-- General William Mitchell,  
*Winged Defense* (1925)

# DEVELOPMENT OF AIR DOCTRINE

1917 - 41\*

*James L. Cate*

**A**MONG its colored charts and uncolored judgments, the sober report of the *U. S. Strategic Bombing Survey* contains this figure of speech: "Air power in the last war was in its infancy.... In this war, air power may be said to have reached a stage of full adolescence."<sup>1</sup> Whoever is curious to understand that growth in maturity in the U. S. Army air arm between Chateau-Thierry and Rouen-Sotteville No. 1 may find that there is a political, a technological and an intellectual phase to his problem. He may study the long and bitter struggle for an independent air force; or the constant search for bigger and better bombers; or the development of a new concept of war built around the air weapon. Those phases were mutually interdependent, and to determine which was the controlling factor might involve the student in some "hen-first-or-egg-first" sort of metaphysics, but either might serve as a convenient avenue of approach. American interests being what they are, we need fear no neglect of politics or technology; we may leave the independent air force with Congress and the heavy bombers with Boeing and Consolidated, and examine the growth of doctrine as if we were proper theologians. Without stretching the evidence too greatly one might suggest the thesis that it was the growth of a new concept of air employment which guided the air arm in its struggle for a more suitable command structure and its efforts to develop an efficient heavy bomber. For that concept was built around a type of operation, called since 1917 "strategic bombardment," which

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\* A paper read at the Fortieth Annual Meeting of the Mississippi Valley Historical Association, Columbus, Ohio; April 24, 1947. The author has written a fuller account of the growth of air doctrine in the first volume of a general history of the Army Air Forces which should appear soon. *Editor.*

<sup>1</sup> *The United States Strategic Bombing Survey. Over-all Report (European War)*. September 30, 1945 (Washington, 1945), p. 1.

required for its effective use some degree of independence from the ground arm and aircraft of long range and great bomb load. In the limited space at our disposal we cannot develop this thesis, but can sketch in briefly the main lines of doctrinal development.

To trace the genesis and growth of an idea is always a hazardous venture, and here there are pitfalls of a special sort: the anonymity or composite authorship of Army documents; an Army publication code which encouraged repetition and made a virtue of plagiarism; and the difficulty of determining the reading habits, if any, of the unidentified authors. Properly we should be able to trace the evolution of air doctrines in the appropriate training manuals and directives, but the assembling and perusal of a complete file of such texts would prove a task more arduous than profitable. Composed in that classic War Department prose style, and studded with such irrefutable truths as "The mission of bombardment aviation is the bombardment of ground objectives,"<sup>2</sup> the official manuals convey a most erroneous impression of the progress of thought in the Air Corps. If air officers accepted perforce the doctrines contained therein, it was often with the sort of lip service which might be paid by a liberal clergyman to an outworn creed.

In February 1942, when the advance echelon of the VIII Bomber Command was just arriving in the United Kingdom, General Arnold informed the commander of U. S. Army forces in that area that the RAF should be impressed with the fact that "only American doctrines and principles" must guide our operations.<sup>3</sup> Like the nation itself, the AAF had been nurtured in a European tradition, borrowing especially from British ideas, and this brusque statement might be interpreted as a new declaration of independence. Actually the difference between AAF and RAF doctrines lay rather in the techniques to be employed than in the ends desired. But the point of interest here is that, while Arnold's meaning was clear to his correspondent, the contrast he referred to was

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<sup>2</sup> *Field Service Regulations, U. S. Army* (Washington, 1924), p. 23.

<sup>3</sup> CM-OUT-576 (21 Feb. 42), Arnold to Chaney, AF #2/353, 21 Feb., 42 (paraphrased). [MS materials cited in this paper are from archives of the AAF Historical Office at Washington, D. C., except those coded AAG, which are from the Air Adjutant General's files.]

not explicit in the most recent official pronouncement on air employment -- War Department Training Circular No. 70.<sup>4</sup> That manual erred, as had all promulgated since 1935, in giving both sides of all controversial issues with no firm preference. This "straddling," as a bombardment-minded officer termed it,<sup>5</sup> was indicative of divided counsel rather than of judicial impartiality, and the texts, as perhaps some of you who taught from them will remember, were but feeble instruments of indoctrination. Worse still, most of the manuals published before 1935 were actually antagonistic to the most advanced thought in the Air Corps.

THE REASON is not far to seek. Control over the formulation and dissemination of combat doctrines was vested in a General Staff composed of ground officers and the air manuals had to be denatured to suit their taste. The tone had been set in 1919 when returning veterans of the Air Service, AEF, had first attempted to reduce war-time lessons to peace-time training guides.<sup>6</sup> Whatever ideas of an independent air mission they may have entertained were effectively scotched by official pronouncements in that year by the Dickman Board,<sup>7</sup> by General Pershing<sup>8</sup> and by Secretary of War Baker.<sup>9</sup> The theory of war endorsed in these reviews of recent experiences received its most authoritative statements in the 1923 revision of the Field Service Regulations, U. S. Army. This starts from an axiom borrowed from Clausewitz: "The ultimate objective of all military operations is the destruction of the enemy's armed forces by battle. Decisive defeat in battle breaks the enemy's will to resist and forces him to sue for peace."<sup>10</sup> Victory in the offensive requires

<sup>4</sup>WD TC No. 70, Army Air Forces Basic Doctrine, 16 December 1941; a mimeographed pamphlet issued pending revision of FM 1-5 and publication of FM 100-15.

<sup>5</sup>Maj. W. R. Carter, *Employment of Army Air Forces*, 12 April 1938; in AAG 321.9, *Doctrines of Air Corps, Unclassified Files*.

<sup>6</sup>Wm. Mitchell, "Our Army's Air Service," *American Review of Reviews*, LXII (September, 1920), pp. 281-90.

<sup>7</sup>*Hearings before the President's Aircraft [Morrow] Board*, I (Washington, 1925), 21.

<sup>8</sup>*Ibid.*, p. 23.

<sup>9</sup>*Report of the Secretary of War for Fiscal Year Ending June 30, 1919*, in *War Department, Annual Reports, 1919*, I (Washington, 1920), *passim* and especially pp. 68 ff.

<sup>10</sup>*Field Service Regulations*, p. 77.

cooperation of ground and air forces: "No one arm wins battles," but the "...coordinating principle which underlies the employment of the combined arms is that the mission of the infantry is the general mission of the entire force. The special missions of the other arms are derived from their powers to contribute to the execution of the infantry mission."<sup>11</sup> Briefly, the chief role of aviation was close support.

For ten years the manuals of the Army air arm, while attempting modestly to enhance the importance of the role of aviation, adhered closely to the central thesis of the Field Service Regulations. Thus Training Regulation 440-15 (1926) states that the organization and training of air units should be "...based on the fundamental doctrine that their mission is to aid the ground forces to gain decisive success."<sup>12</sup> Even at the Air Service Tactical School the handbook on bombardment published the same year dealt only with "...operations in support of, or in conjunction with, large forces of ground troops ....," deliberately omitting consideration of "... independent air force operations."<sup>13</sup> Indeed, the authors deplore the fact that "... the strategic employment of bombardment in stabilized warfare is popularly conceived to be the true role of that class of aviation."<sup>14</sup>

THIS WAS a flank attack on Billy Mitchell, forced to resign from the Army a few months before, who had popularized that view in America. But the implied criticism was not wholly candid, for Mitchell's ideas had infected the Air Service as well as the public; they are then far more significant than the official pronouncements. Mitchell's crusading ardor, his flair for publicity and his posthumous canonization have made familiar to all the general outlines of his concept of Air Power, so that it should here suffice to point out several important factors in the development of his thought. Perhaps the most powerful of the early influences was Sir

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<sup>11</sup> *Ibid.*, p. 11.

<sup>12</sup> T. R. No. 440-15, *Fundamental Principles for the Employment of the Air Service* (Washington, 26 January, 1926), para. 4.

<sup>13</sup> ASTS, Langley Field, Va., *Bombardment* (Washington, 1926), p. 54.

<sup>14</sup> *Ibid.*, p. 72.

Hugh Trenchard, who commanded the Royal Flying Corps in France when Mitchell first met him in May 1917. Entries in Mitchell's diary indicate how profoundly he was impressed by the advanced views of the Britisher, and suggest that this was the source of two of Mitchell's cardinal principles: that the airplane was essentially an offensive weapon and that the first mission of aviation was to gain air ascendancy through offensive action. In 1918 Trenchard was given control of the RAF's Independent Air Force, and his design for the bombardment of Germany, originally conceived as a retaliatory measure, developed into the first articulate program of strategic bombardment.<sup>15</sup> By Armistice Day arrangements had been made for Americans to cooperate in this program as a part of the Inter-Allied Independent Air Force,<sup>16</sup> and Mitchell was apparently in sympathy with its underlying philosophy.

But if Mitchell's ideas were originally derived from foreign sources, they were conditioned both by his own experience in France and by the American environment after his return. It was axiomatic with him that the aviation problems of each nation differed, and while his earliest publications on Air Power -- magazine articles published in 1919<sup>17</sup> -- were largely descriptive of Air Service combat in close support of ground armies, he soon adopted an approach more typically American in viewpoint. Traditionally we had thought of war in terms of national defense; in the reaction which followed the "great crusade" it appeared unlikely that we would again fight a continental war in Europe of the sort described in Mitchell's early articles or in the Field Service Regulations. Close support of field armies would be necessary only after an enemy had landed an expeditionary force on this continent, and whereas the Navy had always constituted the first line of defense against that contingency, Mitchell proposed to substitute for it an air force. As early as 1919 he had suggested tentatively the idea which was responsible for much of his fame (or notoriety, depending

<sup>15</sup> H. A. Jones, *The War in the Air*, VI (Oxford, 1937), chs. III, IV.

<sup>16</sup> *Ibid.*, Appendices No. V, VI, IX, X, and XIX (in separate volume)

<sup>17</sup> Wm. Mitchell, "The Air Service at St. Mihiel," *World's Work*, XXXVIII (August, 1919), 360-70; "The Air Service at the Argonne-Meuse," *Ibid.* (September, 1919), pp. 552-60.

on your point of view) -- that the airplane had doomed the capital ship and hence the entire surface navy, and throughout his career that thesis was to occupy in his thought a prominence justified only by national geography and national patterns of thought. Thus in his first book, published in 1921, he only hints at the possibilities of air attack on an enemy's economy and names the armed forces as the ultimate objective: "Our doctrine of aviation, therefore, should be to find out where the hostile air force is, to concentrate on that point with our Pursuit, Attack and Bombardment Aviation, to obtain a decision over the hostile air force, and then to attack the enemy's armies on the land or navies on the water and obtain a decision over them."<sup>18</sup>

But improvements in aircraft performance, always projected into the future by Mitchell's enthusiasm, and his concern with island bases lying along the great circle routes of the higher latitudes, suggested the possibilities of air attack against the United States. Those islands pointed away from, as well as toward, the United States and perhaps it was political acumen which led him, in the isolationist America of the 1920's, to describe his theory of strategic bombardment first in terms of what might happen to New York, not of what we might do to Berlin. You will remember that he called the books in which he laid down operational principles for his *offensive* weapon, *Our Air Force: the Keystone of National Defense* and *Winged Defense*.<sup>19</sup> But for all his circumlocution, he had by 1925 advanced a theory of war based on an air attack against the enemy's national resources rather than against his armed forces, and had suggested, in his plan for seizing island bases, a means by which the United States could conduct such a war against either Europe or Asia. Perhaps his most succinct statement of his theory appears in *Skyways*:

War is the attempt of one nation to impress its will on another nation by force after all other means .... have failed. The attempt of one combatant, therefore, is to

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<sup>18</sup> Wm. Mitchell, *Our Air Force. The Keystone of National Defense* (New York, 1921), p. 15.

<sup>19</sup> *Winged Defense. The Development and Possibilities of Modern Air Power, Economic and Military* (New York, 1925).

so control the vital centers of the other that it will be powerless to defend itself.<sup>20</sup>

Armies and navies were developed as a means of preventing an enemy from getting at the strategic spots and with the advantage given the defense by modern weapons, war had become a slow and bloody affair. But

The advent of air power which can go to the vital centers and entirely neutralize or destroy them has put a completely new complexion on the old system of war. It is now realized that the hostile main army in the field is a false objective and the real objectives are the vital centers. The old theory that victory meant the destruction of the hostile main army, is untenable. Armies themselves can be disregarded by air power if a rapid strike is made against the opposing centers....<sup>21</sup>

In December 1925 a journalist wrote, apropos of the court-martial of the Air Service's stormy petrel, "Mitchellism will remain after Col. Mitchell has gone."<sup>22</sup> In the organizational dispute which had been the chief cause of his downfall, Mitchellism scored but limited gains in the Air Corps Act of 1926 and the formation of the GHQ Air Force in 1935. In the subtler realm of doctrine its influence was perhaps more important. In that respect we may discern a right wing and a left wing among the prophet's followers. The GHQ Air Force did provide in theory an instrument capable of independent operations, and the nature of those operations became an issue of cardinal importance for the Air Corps. With the growing unrest in Europe and Asia in the middle thirties the problems of national defense were studied with increasing seriousness, and there were those in the Air Corps who because of conviction or of expediency were willing to go along with the War Department and the Joint Army-Navy Board in limiting the role of GHQ's air striking force to quasi-independent activities. These were largely defensive in character, subordinating strategic bombardment to counter-air activities and to such over-water operations "in support of or in lieu of naval forces" as were allowed by the Joint Action of the Army and Navy of 11 September 1935.<sup>23</sup>

<sup>20</sup> *Skyways* (Philadelphia, 1930), p. 253.

<sup>21</sup> *Ibid.*, p. 255.

<sup>22</sup> *New York Evening Post*, quoted in Isaac D. Levine, *Mitchell: Pioneer of Air Power* (New York, 1943), p. 331.

<sup>23</sup> Para. 22, a (31).

This view is epitomized in an Air Corps memo of 1935:

National policy, geographic location of bases and the present range of planes which does not permit the air attack of the national structure of any probable enemy, dictate the role of the GHQ Air Force as one of air defense and fix its true objective.<sup>24</sup>

When in 1938-1939 "hemisphere defense" supplanted "national defense" as a slogan, this theory was extended to cover new territories, but strategically it remained much the same. Ostensibly, at least, the B-29 was designed in 1940 to prevent Axis powers from establishing bases in Latin America rather than to carry the atom bomb to Hiroshima. In June of that year an Air Corps general, anxious to secure the aid of the automobile industry's most prominent pacifist, could write in all seriousness: "It should not be difficult to convince Mr. Ford that the bomber, as far as we are concerned, is not an offensive weapon but the best means we have available to defend the United States."<sup>25</sup>

IF THIS group of air officers adopted only the early aspects of Mitchell's thought, the others, whom I have called the radicals, were willing to accept the whole of his doctrine. In the early thirties the Air Corps Tactical School came to be dominated by men of that stamp. This had not always been so. As late as 1928 the Chief of the Air Corps had rejected a paper on "The Doctrine of the Air Forces" submitted by the ACTS commandant because it subordinated the air force to the ground force.<sup>26</sup> But lectures delivered at the school from 1931 on leave no doubt as to the thoroughness of the revolution in thought. One of the instructors has later told of their difficulty in getting detailed materials for courses, and something of their reading: Clausewitz (who was "right in his time"); Frank Simon's *The Price of Peace* ("a very good book, too"); "old" Liddell Hart; Goering; and Douhet

<sup>24</sup> ACTS Study of Proposed Air Corps Doctrine Submitted by WPD on 4 December 1934, Maxwell Field, 31 January 1935; in AAG 321.9, Doctrine of Air Corps, Unclassified Files.

<sup>25</sup> Maj. Gen. B. C. Emmons, CG, GHG AF, to OCAC, Commercial Manufacturers of Aircraft, 12 June 1940; in AAG 452.1 "C" Heavy Bombers.

<sup>26</sup> First ind., the Commandant, ACTS to C/AC, 30 April 1928, OCAC to Commandant, ACTS, 1 September 1928; in AAG 321.9, Doctrines of Air Corps, Unclassified Files.

(who "really struck the first blow").<sup>27</sup> I believe that the first English translation of Douhet was a mimeographed edition done for the school in 1932.<sup>28</sup> For the most part, however, their lectures could have been written with Mitchell as a sole authority. They taught an offensive type of warfare, aimed at the enemy's will and power to resist, in which the three arms cooperated but in which each arm had a special mission. The air role, they modestly suggested, was to attack the whole of the enemy national structure. Modern war with its extravagant material factors places an especial importance upon a nation's economic structure, particularly upon its "industrial web." A nation could be defeated by disturbing the delicate balance of this complex organization, which is vulnerable to air attack. Disturbances in this close-unit web might wreck the enemy's will to resist, but the real target was industry itself, not national morale.

In two important practical aspects of the air war, the lecturers went further than had Mitchell. They realized the improbability of our fighting a major war single-handed: "If we were dragged into a war which had been precipitated by other great powers among themselves, we would inevitably find allies. Those allies being themselves within the sphere of air influence, could provide operating bases for our Air Force .... [to which] it is possible, with modern aircraft, to fly direct .... from the Western Hemisphere."<sup>29</sup> And they realized too that to disrupt an enemy's industry by bombardment requires more than random strikes at targets of opportunity, so that ".... it is a function of peacetime strategy to weigh the war potential of possible enemies and uncover those relatively defenseless areas that can be profitably exploited by our attack."<sup>30</sup>

Those practical considerations, as well as the general

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<sup>27</sup> Interview with Brig. Gen. H. S. Hansell at Norfolk house, England, 5 October 1943; in Eighth Air Force Files.

<sup>28</sup> Edward Warner, "Douhet, Mitchell, Seversky," in E. M. Earle, ed., *Makers of Modern Strategy* (Princeton, 1944), p. 489.

<sup>29</sup> Much of the substance of these lectures may be found in a paper by Gen. Hansell on "Development of the U. S. Air Forces Philosophy of Air Warfare Prior to our Entry into World War II. The present quotation is from a lecture by Hansell himself in 1935/6, on *The Functions of Air Power in our National Economy*.

<sup>30</sup> Lecture by Capt. Harold L. George, *Air Force Objectives, 1934/5*, quoted in the same source.

theory, were to assume more tangible form in 1941. By March of that year, Anglo-American staff conversations had assured us of advanced air bases in the United Kingdom if we entered the war.<sup>31</sup> And for some time before that the tiny Economic Analysis Branch of the Intelligence Section in the OCAC had begun on a modest scale a systematic study of profitable targets in Axis territories. When the AAF staff was created in the spring of 1941, its Plans Division (AWPD) was staffed almost entirely by former instructors of the ACTS, and the theory they had taught inspired the first of the air plans for World War II. That document, known as AWPD/1,<sup>32</sup> I should like to submit as Exhibit A for the defense in the recent debate in *Harper's* on the "military mind." Composed in a few days of frenzied effort by a handful of officers, including Hal George, Possum Hansell, Larry Kuter and Ken Walter, it gave a preview of the European phase of the war which was in most important respects remarkably accurate. AWPD/1, which listed the aviation requirements for the so-called "Victory Program," was incorporated into the Joint Board Estimate of U.S. Over-all Production Requirements of 11 September 1941--the famous "secret war plan" published by the *Chicago Tribune* three days before Pearl Harbor as a scoop to greet the first dawn of the *Chicago Sun*. The air plan contemplated a long and intensive bomber offensive against Germany which would reach its climax in the spring of 1944; this alone might finish off Germany (note the qualification), but provision was made also for support of a landing on the continent and a subsequent land campaign.

IN BROADEST outline this theory of the air war was akin to that held by the RAF, though Bomber Command's Sir Arthur Harris was more openly confident that Air Power alone could defeat Germany.<sup>33</sup> But as to the means of accomplishing the desired ends, the two air forces differed sharply. Two years of war had convinced the RAF that only night bombing was regularly feasible against German defenses, and limited

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<sup>31</sup> United States-British Staff Conversations. Short Title ABC-1. 27 March 1941, Para. 47.

<sup>32</sup> Munition Requirements of the AAF for the Defeat of Our Potential Enemies. Short Title AWPD/1. 12 August 1941.

<sup>33</sup> See book review by Col. Dale O. Smith in this issue. *Editor*.

experiments with the B-17 inclined them to extend this judgment to the AAF. Night bombing with instruments then available meant area bombing, and because of the proximity of workers' homes to industrial concentrations, the British tended to stress more than Americans the morale effects of bombardment.

AWPD/1, on the contrary, was dedicated to the principle that the German war potential could be paralyzed by the destruction of a limited number of strategic targets, vulnerable only to daylight precision bombing -- "pickle-barrel bombing" it was optimistically called. Such bombing had been taught at Air Corps schools, and under ideal training conditions had enjoyed some success. The origins of this tactical doctrine are hard to account for -- in World War I practice and in Air Corps theory as late as 1926 strategic bombardment was a night operation. Possibly the American tradition of expert marksmanship had an indirect influence. Distaste for indiscriminate bombing of civilian areas, so general in that old-fashioned world which was ours before Guernica, Warsaw and Rotterdam, put a premium on accuracy. So too did the emphasis placed in our national scheme of defense on attacks against naval craft. The impressive scores of the 1920's had been made in low to medium altitude attacks against defenseless ships at anchor. As antiaircraft weapons improved, superchargers carried bombers above the effective range of flak; improved bombsights (Norden and Sperry) and formation pattern bombing compensated partially for the increased altitude. Techniques and equipment designed for defense against naval forces could easily be adapted to offensive use against land targets and they were. Air strategists considered precision methods to be no more than a refinement of the principle of economy of force which was basic to the whole concept of strategic bombardment.

Obviously no one could object to accuracy, though the objectives in the RAF's saturation attacks were not wholly to be accomplished by destruction of a limited number of pin-point targets. It was the question of feasibility, not desirability, of precision tactics which distinguished RAF from AAF thinking. Precision bombing meant daylight bombing,

and the RAF was convinced from its own and from the Luftwaffe's experience that such tactics were too expensive against constantly improving defenses over Europe. AAF planners were confident that daylight operations *could* be conducted profitably. They had urged, somewhat belatedly, the development of a long-range escort plane to protect the heavies against GAF fighters, but it was to be late in 1943 before such a plane was to appear. When the United States entered the European war, the AAF had to depend on the rugged construction of the B-17 and B-24; upon the firepower of tight formations of those planes, each mounting ten .50 caliber machine guns; and upon the saving grace of 25,000 feet of altitude. In their friendly debates the RAF could argue from experience, the AAF only from faith. Perhaps even that wore a little thin at times. Through circumstances of a sort not always common in war, some of the staff planners who had given the final theoretical formulation to the doctrine of high altitude, daylight, precision bombardment were in command positions when their tactics were first put to test. One of them has since written that "There were, frankly, many times when we seriously doubted the practical adherence to such a high-flown motto."<sup>34</sup> Nevertheless, they were willing, as the couplet runs in *Hudibras*, to

*Prove their doctrine orthodox  
By apostolic blows and knocks.*

What more could you ask of a staff officer?

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<sup>34</sup>Hansell to the author, 24 February 1947.

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*The all-important initial crisis of any future war must be met by the Air Force we have when war starts. We cannot rely on a cadre Air Force, for during a war of hours, days or weeks, we would have no time to expand it.*

-- General Carl Spaatz,  
in *Collier's*  
(December 8, 1945)

# A LECTURE ON AIR POWER

*Major Alexander P. de Seversky*

## PART II\*

LET ME REVERT to my earlier image of two opposing fortresses shooting it out with long-range weapons as the basic condition of the next war. The problem it poses is one of tactics and weapons for such a conflict.

The first World War ended without any remarkable advances in aircraft. The second, on the contrary, ended with most startling advances in aeronautical science. Some of the new inventions and discoveries played only small roles in the second World War only because, having emerged towards the end, they could not be applied in sufficiently large numbers. But their effects on the future of aeronautics will be incalculable. The greatest impetus to Air Power came in the closing months of the war, in the application of new methods of propulsion. At last aircraft obtained their own appropriate source of power -- the jet. The reciprocal engine which aeronautics had borrowed from the automotive industry is distinctly unsuited for aviation, whereas jet and rocket engines are ideal for the requirements of aircraft.

With the advent of this engine, aviation is certain to become the most efficient, the safest and the cheapest form of transportation. Eventually, I am convinced, almost the entire express and passenger transport of the world will go by air, especially over long distances. It will be the most efficient way of transporting men and goods for the same reason that long-range aircraft operating directly from our mainland will be the most efficient way of transporting destruction to an adversary.

I have already emphasized that any base from which we plan to undertake decisive action ought to be so located that enemy action will provoke a major, decisive air battle into which we can throw the whole weight of our Air Power. But wherever the decisive battle is fought, it will be a

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struggle for control of the entire air ocean around our planet.

**NOW THERE IS** a school of thought that insists we shall be able to get at enemy targets in the future without combat, because of the enormous speeds of aircraft. It seems to me this is repeating an old fallacy. Some of our leaders, before the recent war, similarly believed we could bomb enemy territory without combat. That was why the earlier B-17s lacked sufficient armor and firepower. It was thought they could rely solely on speed. We all know how tragically mistaken and costly this notion proved.

We know now that air action in World War II immediately resolved itself into air battle. Not until we had destroyed the enemy's Air Power were we able to reach the target unmolested. We were forced to arm our bombers to the teeth. The same condition will apply in the future. Even with speeds of 1000 or 2000 or more miles an hour, it will be several hours before we reach the enemy and retire -- a period adequate for interception and combat. As long as men pilot aircraft, hit-and-run bombardment, even with atomic missiles, cannot be decisive. Control of the air will first have to be established.

Only with the advent of long-range rockets will it become possible to talk of penetration without combat. The rocket will in that case become the artillery of the two "fortresses." But transcontinental and transonic rockets are still very far off. At the present stage, a rocket that could be fired from our mainland against a target several thousand miles away would have to weigh roughly 400,000 tons, or the equivalent of four battleships. To be effective, a great rate of fire would have to be sustained. Imagine sending such a rocket every second or so! We would exhaust our total wealth in a few minutes.

Suppose that in a few years we could produce commercially some of the new fuels recently developed in laboratory tests. With this and other scientific advances, the bulk and cost of such long-range rockets might be reduced in some predictable period from four battleships to one cruiser. But even "cruisers" fired with the rapidity of machineguns will

be a fantastic proposition and an impossible drain on resources. It is much too soon therefore to base strategy on theoretical long-range rocket siege artillery.

Naturally, if and when atomic energy will be perfected to the point of use for atomic propulsion, the principles of flight will be wholly revolutionized. While strategy will still remain essentially unchanged -- it will still aim at the destruction of the source of enemy power -- weapons and tactics will then be quite different. Once we possess an inexhaustible source of power, distance will be annihilated and range will cease to be a consideration. We will be able to build any kind of plane, large or small, fast or slow, at will; only battle or military characteristics will be considered.

**BUT UNTIL** that space-annihilating miracle happens, as long as we must deal with the present known means of propulsion, range and distance must in largest measure affect the design of aircraft. Since bigger structure gives more efficient combination, the size of aircraft will keep increasing as we strive for longer range. The climax will come when we attain a range equal to the circumference of the earth. Beyond that, of course, increase in range will make no sense, since nobody wants to fly around the world indefinitely. Except for stunt and record-breaking purposes, that will be the functional limit of range. After round-the-world range is achieved, the size of aircraft may begin to shrink as speed and performance are stepped up with the progress of science.

In any case, proper military characteristics will be the primary consideration in design. Such long-range airplanes will be the backbone of our military strength for some time to come. Until new materials and fuels are developed, guided missiles and rockets will be merely an adjunct of Air Power, in the sense that the torpedo is an adjunct of Sea Power.

Theoretically we can send guided missiles any distance. But the time is very far off, if it ever comes at all, when guided missiles can score a final decision. So far, on land and sea, guided missiles have been weapons of opportunity which could not by themselves bring a decision. The Germans had guided tanks controlled by radio and long cables. As

soon as those guided tanks entered direct armed conflict, it always developed that human intelligence had the edge and the robot tanks were quickly destroyed.

I foresee that the same thing will happen in the future with guided robot airplanes. Human intelligence at the defensive end will tend to take the upper hand. I don't mean that the guided missiles will not have important functions; but to give them a primary strategic position and to pour too much of our national resources into them would seem to me extremely risky.

You cannot exploit your Air Power to the utmost until you take control of the air and destroy the opposing Air Power. Similarly, you cannot exploit guided missiles fully until you destroy the enemy's electronic power. Please recall that our electronic impulses diminish roughly in the proportion of the square of the distance. In guiding our missiles, let us say, from the United States to Europe, the advantage will shift to the enemy's side as soon as the halfway mark is reached. The nearer the missile gets to Europe, the smaller the effort needed at the receiving end to take over control and divert its direction.

Of course, there will be devices to prevent interference with the guided missiles. For instance, automatic celestial navigational means may be found to bring the missile towards a target with deadly accuracy and without risk of interception. But to make contact with the target it will have to enter the field of enemy electronic superiority, and at that point direction will be changed. Some of the guided missiles will go through, but the percentage that can actually hit the targets will be smaller and smaller as defensive methods are perfected. I believe automatic electronic defenses are inevitable, and robot planes minus human intelligence will be easy prey for them.

**T**HE TWO nations engaged in a technological contest of automatic weapons and counter-weapons will tend to neutralize and exhaust each other, just as evenly matched fortresses remain locked in artillery duel until one or the other invests human life to storm the enemy. Automatic devices may soften the enemy to the point where human attack on the

sources of its power becomes practical. At that stage men will have to jump into their cockpits, fly directly to the enemy area, and destroy the remnants of its air and electronic power. After that, we shall have a free choice of means in accomplishing the final elimination of the enemy. Only after we have denuded our adversary of air and electronic strength shall we be able to retire to the Pentagon building, relax and send our robots to do their stuff. Even then, however, the job will be done more quickly and economically by human pilots than by guided missiles.

When the torpedo first appeared, it was said that it spelled the doom of the surface navy. It was predicted that radio-guided torpedoes would be designed to operate through all the seven seas. But what actually happened? The torpedo by itself did not become a decisive weapon. It simply provided an important adjunct to the surface navy. Even thus I believe that for some time to come guided rockets will simply be an important adjunct of Air Power. They will be brought by aircraft within striking distance of the target and sent to their destination from close range.

For reasons I have already explained, we will not be able to launch the missiles from conveniently close bases, since these bases will be untenable. Nor will we be able to launch them from our mainland, due to lack of range. Delivery by aircraft therefore appears the only solution. As the atomic warheads of these missiles grow more powerful, it will obviously be necessary to deliver them at a safe range so that the explosion will not destroy the attacking aircraft along with the target. Such aerial torpedoes, of all types and sizes, will become the main weapon in our arsenal: rockets from airplanes to the ground, from ground to airplane, from airplane to airplane. These guided weapons may well become the most important fire-power of our Air Force. But it will be a long time before they assume any real independent strategic significance. In other words, the much discussed push-button war is still deep in the realm of wishful thinking.

**H**AVING THUS put rockets and guided missiles in their practical place, let us see how we can implement long-range air

strategy with conventional aircraft. Right now we are on the verge of flying aircraft faster than the speed of sound and it is quite possible that in a short time jet-propelled aircraft will fly at 1200 and even 2000 miles an hour. Beyond such speeds we shall run into problems of heat generated by air friction. The V-2, for example, at its top speed heated up to 600 degrees centigrade. Even at 2000 miles an hour we must therefore expect temperatures that the human organism cannot endure. This may prove to be the limiting factor, for the time being, on speed in piloted aircraft.

Speeds of 1000 or 1500 m.p.h. are, I think, quite practicable. They will not materially affect basic strategy. Tactics will have to be revised, but strategy will remain the same. Tactics will be affected because the human body can stand only a certain amount of acceleration. As long as the pilot flies straight and level, the speed makes no difference. But when he executes a turn, the radius of that turn becomes important; acceleration, as you know, is the function of speed and radius of turn.

I have been flying since 1914. Every time a speed record was broken, there were assertions that the limit of human endurance had been reached. This happened when planes flew at 60 m.p.h., 100, 200 and so on. But endurance depends on the number of hours you have to sweat it out in the cockpit and on the hazards of the mission. In the first World War, I flew bombing expeditions that lasted five hours at 80 miles an hour. I was not any less fatigued than when I broke the record from New York to Havana in five hours at an average speed of nearly 300 miles an hour.

As far as the sensations of the pilot are concerned, it will make little difference whether he flies from London to Berlin and back at 200 m.p.h., or makes the same six-hour flight to the Ural Mountains and back at 1200 m.p.h. A six-hour flight will still be a six-hour flight. Nor will there be any important change in his efficiency. He will still have to carry destructive force -- whether atomic bombs, rockets or guided missiles or all types -- and he will still have to carry offensive and defensive fire-power. During the period of flight he will meet all types of hazards and obstacles: other aircraft, anti-aircraft fire, all sorts of

rockets and guided missiles from the ground.

Thus in spite of vastly stepped-up speed, aerial combat in one form or another will be inevitable. It would be reckless to suppose we could build bombers speedy enough to penetrate the enemy's defenses at will or that, in general, decisive attack can be carried out without combat. The bomber of the future will be furiously attacked and will have to be vigorously defended. It will not be able to carry sufficient defensive power and must therefore be shielded by escort fighters. These fighters may take entirely new forms, but they will remain indispensable. Escort tactics will be different but basic principles will remain unchanged. As the battle progresses and enemy defenses stiffen, it will take more and more fire-power to protect the delivery of the same amount of destruction.

The bombing or attacking plane reaches a design saturation point beyond which additional fire-power or other defensive means will have to be carried by separate escorting planes. This will hold true as long as the atomic bomb can destroy only *a target* and must be carried in man-piloted aircraft. As long as airplanes rather than transoceanic robot rockets are used, I can foresee no revolution in the basic strategy I have here indicated.

Though equipment and tactics change, fundamental principles remain. In spite of the more complicated equipment coming into use, planning and implementation for the next war will in some respects be simplified as compared with World War II. For one thing, planes will be built for specific missions. In the past we built aircraft to fight in all kinds of places under all kinds of conditions. We sought to give them longer range, greater speed and bomb-carrying capacity. But precisely where we were going to use them, and under what conditions, we did not know for certain. They had to be equally effective for the Atlantic or Pacific, the tropics or the arctic. The design therefore was usually a broad compromise, with the limitations that any compromise involves.

**I BELIEVE** the next war will be different in this respect. We shall build for a definite target, for the solution of a

definite problem, to meet a known set of conditions. This time the potential source of danger, the potential enemy, has been limited to a definite area. We are in a position to plan and build Air Power uniquely suited for the job in view. Our aircraft will be, so to speak, tailor-made for a specific job. When a problem is known in advance, the task of the designers is greatly simplified. Many things can be done to enhance performance that were not possible in a general-utility aircraft. The planes will tend to assume the character of siege artillery put in place for the most effective use against a specific spot in the enemy fortress.

To illustrate what I mean, consider a bomber like the B-36, which can carry ten tons of bombs over a range of 10,000 miles. Since we know exactly from what base and to what destination the bomber will have to operate, we can equip the base in such a way as to relieve this bomber of its landing gear. We can thereby increase flying range by 30 percent or increase load-carrying capacity for additional bombs or additional defensive armament. Naturally, the base will be of a rather more elaborate character. It will have some sort of catapult and landing and arresting devices instead of the orthodox concrete runway. Such a base may be more vulnerable to enemy attack. Over-all strategic considerations will dictate the decision.

Aircraft without landing gear is only one of many innovations that suggest themselves. In studying the implementation of long-range strategic plans based on long-range aircraft action I came to one rather interesting conclusion; namely, that with the advance of jet and rocket propulsion the seaplane may become aerodynamically and tactically a more efficient aircraft than a land plane.

I realize, of course, that these views come at a rather inopportune time, when we seem to have agreed amicably with the Navy that it will have jurisdiction primarily over all water-based craft while the Air Force will exercise control primarily over all land-based craft. But I recall that the Navy, on second thought, has requested to retain some land-based aircraft primarily for long-range reconnaissance work. There is no reason therefore why the Air Force should not develop its own water-based airplanes if these are needed

for Air Force tasks.

In the final analysis, it does not make any difference whether an aircraft rises from water, from land, or from a catapult. The important thing is what it is designed to do after it becomes airborne. If it carries attack to the strategic enemy installations and is capable of sustaining an air battle, then such a plane belongs to the Air Force. If, on the other hand, it is designed purely for the purpose of enhancing the efficiency of ships and naval task forces, then the plane is part and parcel of the Navy.

Tactically, the advantage of the water-based aircraft as against land-based lies in the lesser vulnerability of its bases to atomic bomb attack. In atomic warfare, a single bomb will unquestionably be able to dispose of one marshalling strategic airdrome. Our fleet of striking aircraft will be a very formidable armada. It will consist of planes weighing, on an average, approximately 150 tons each.

Obviously it would be impractical to equip ourselves with an infinite number of strategic air bases, so that the destruction of any number of them would not affect operations. However, it would be unsound to pour billions of dollars into concrete and hangar space which could be liquidated by the explosion of a few atomic bombs. Furthermore, thus far the only defense against atomic bombs is distance, which means the widest dispersal of planes, equipment and facilities. Unfortunately the topography of the earth is not on our side -- such freaks as Muroc Lake are few and far between.

Water provides an unlimited expanse for take-off area. You can disperse your strategic facilities as widely as required. The loading and maintenance facilities do not necessarily have to be permanent shore installations. They can also be movable. Thus, while an atomic attack against a water base may result in the destruction of a few planes and some maintenance facilities, operation of the striking force could continue without interruption by moving the whole installation only a few thousand yards.

My own study of atomic bomb action against Nagasaki, Hiroshima, and later at Bikini, convinced me that in future warfare water may prove to be a very efficient base for the

Air Force in being.

In the past, of course, the performance of land planes was so much superior to that of sea planes that the idea would have been unthinkable. However, with the advent of rockets and jet propulsion the differential in performance between the two types is rapidly diminishing. Use by the Air Force of both types of aircraft will serve as an insurance against any contingency that might impair our ability to sustain a strategic air offensive.

**N**OW LET US turn to the subject of supersonic speeds. Many years ago, I recall, it was predicted that airplanes would never exceed 300 m.p.h.; that pilot and plane would disintegrate beyond that speed. But we broke through 300 miles with the greatest of ease. When I returned from a European trip in 1939, just before the war started, I predicted that aircraft would soon attain speeds of 500 m.p.h. My Board of Directors felt it necessary to issue a press statement asserting that in forecasting such fantastic speeds I was speaking only for myself and not for the Seversky Aircraft Corporation. The joke of it is that the very aircraft I designed, equipped later with more powerful engines, water-injection and special propeller, did reach the 500 miles an hour mark.

Today there is the same fear and skepticism about 1000 miles an hour. Again I wish to put myself on record that it will be just as comfortable cruising at 1000 miles as it is today at 500 and 600 miles an hour. I had the good fortune to fly the ME-262 twin-jet aircraft in Germany. Then, not long ago, in England, I piloted the jet Vampire plane with a speed of 540 m.p.h. In testing the latter plane I couldn't resist satisfying my curiosity as to what would happen to the aircraft when it reached compressibility. I pushed a bit downhill, reaching the neighborhood of 600 m.p.h. A lot of things did happen, but the aircraft stayed together and I was able to get back safely and soundly. I was luckier than Geoffrey De Havilland, who flew the next, more advanced type of Vampire. No one knows exactly the cause of his disaster but presumably the plane disintegrated when it hit compressibility.

In flying these jet planes I did not encounter any extra strain or discomfort. On the contrary, I found them more pleasant, quieter, simpler to operate. I'd fly a jet plane any day in preference to the conventional aircraft. Those of you who have flown jets will no doubt agree with me. I am confident that there will not be any different sensation flying at 1000 or even 2000 miles an hour, as long as violent acceleration is avoided. Provided the aircraft is properly designed, flying at those speeds will be as comfortable as at subsonic speeds.

Frankly, I feel we are on the wrong track in our present attempts to break through transonic speeds. The Army XS-1 and the Navy Douglas are designed for this purpose, but these planes differ very little from conventional aircraft. They will therefore have to be driven through transonic speeds by sheer force of thrust, supplied by a battery of rockets. It's rather like driving a nail head forward instead of with the point. If enough sheer force is exerted, a nail could be forced through in that manner. The same principle applies to the conventional aircraft -- with sufficient thrust, the break-through may be possible despite superfluous drag.

Unquestionably a lot of useful data will be learned in this fashion. But it is not the kind of plane, I'm sure, that will be the answer to comfortable supersonic flying. Because the supersonic plane will be an important weapon in future long-range aerial warfare, I have devoted considerable time to its problems. I have reached the conclusion that it will not be possible to design an aircraft *along conventional lines* that will be correct for both super- and subsonic flight. An aircraft flying at subsonic speeds would not be practical or stable for supersonic flight, and vice versa. Each type calls for its own geometrical configuration. To embody both configurations in one craft presents serious mechanical problems.

But they are not insoluble problems. Personally I am not disheartened by the claim that the complications will defeat the advantages of the plane. History repeats itself. When the first retractable landing gears and flaps were suggested, a great many people objected on the ground of structural

complications. It was said the additional weight would offset the additional benefits. Yet today those things are universally used. Studying the possibilities of aircraft of variable geometrical configurations, I am inclined to believe that the complications are not so formidable as to make such planes impractical. And once we design an airplane that can adapt itself to both regimes of flight, we will not have to worry about flying comfort at supersonic speeds.

There have been forecasts that when the aircraft hits bumps or pockets at tremendous speeds the shock will hurt or even kill the pilot. This simply isn't so. No such sensations need be expected if the craft is properly designed. Imagine a piece of wood that bobs up and down on top of a wave, making violent vertical oscillations. Suppose you saturate the wood with water until its specific gravity is very close to that of water. You will then find that the piece of wood no longer bobs up and down; the waves roll over it and the wood maintains a constant position in the water -- just as a submarine in its semisubmerged condition does not oscillate but stays put, with the waves rolling over its decks.

**T**HE SAME relative conditions will prevail for a properly designed supersonic aircraft. The aircraft of today operates at high speed at the minimum angle of attack, or minimum  $L$  over  $D$ . It is only natural therefore that when it strikes an up-draft, the result is equivalent to an instantaneous increase of angle of attack, with violent increase of lift -- the airplane zooms upward. But if the aircraft travels constantly at a maximum angle of attack, close to the maximum  $L$  over  $D$ , it will not zoom when it hits an up-draft. In fact, it may even settle down; because in that case further increase of the angle of attack brings you to the point where lift no longer can increase and may even drop.

That is why I am not worried about supersonic speeds. Testing my own aircraft at terminal velocity, flying jet planes -- and somehow I can think and design better in the cockpit than at my desk -- I was convinced that an aircraft can readily be designed suited to both regimes of flight. In such a plane the pilot can be an efficient warrior at

supersonic speeds.

After the last war there were few people in this country with engineering minds who also had combat experience. That is why, in spite of the brilliant engineering talent available, we went into the war with inferior combat planes. We simply did not have the necessary scientific, analytical knowledge of the tactics of aerial warfare. The one exception was in the theory of strategic bombardment, which found expression in the multi-engined, long-range bomber. Even in that case, however, as in the other types, tactical prerequisites like adequate fire-power, armor, self-sealing tanks, etc. were lacking, so that we were placed at the bottom of the list.

Those few of us who did have combat experience had a hard time selling tactical ideas to our Materiel Division -- and found it practically impossible to sell them to the top echelons where final decisions were made. The fine engineers turned out by our universities between the two wars were concerned primarily with building perfect flying airplanes. They were almost antagonistic to problems of combat prerequisites, since these often clashed with aerodynamically good design for a comfortable cross-country flight.

Today the picture has changed. We have a great many young men of engineering and inventive mind who have also had several years of combat experience. I feel sure that this new crop of creative brains, backed up by tactical experience under war conditions, will yield wonderful results in the near future. This factor of experience is precisely what the United States Air Force lacked in the past. Whatever the future picture may be in terms of quantity, we have reason for optimism in terms of quality.

We have always talked about scientists and tacticians getting together to implement strategy. But that depends on the kind of scientists. I don't think we will go far if we intermingle abstract or basic scientists with tacticians. Basic scientists are at their best in laboratories. It is, rather, the applied scientist who ought to work hand in hand with the strategist and tactician. It is that combination which will give us the practical weapons of today and tomorrow.

My experience has been that when the tactical mind governs the creation of weapons they come nearer to the realities of actual combat needs than if they reflect the drafting board mind. In my own case, I know that if I had not had combat experience in the last war, I would not have thought of the long-range escort fighter. It was not because of any extraordinary mental endowment that I was convinced of the need for developing an escort fighter. It was as a result of actual combat war experience.

**IT HAPPENS** that I was in command of the fighter force of the Baltic Sea in 1917. All our bombers were flying boats which could not shoot backward and were therefore incapable of defending themselves against stern attack. The natural procedure for me was to provide escort fighter protection -- and it worked. Then, when I came to the United States and began to design my first military aircraft I immediately thought of the escort fighter. I approached the problem, that is to say, not from an engineering point of view but from the tactical point of view.

First I analyzed the course of development of both bombers and fighters. I observed that it took about three times as long to develop a bomber from combat requirements to operational use as it did to develop a fighter plane. If you build combat and defensive efficiency into the bomber so that it can defend itself against fighters, it can proceed with bombardment without fighter support. But in actual warfare each side seeks to improve its aircraft as fast as possible. It is not as easy to enhance the military characteristics of the bomber as of the fighter. The fighter therefore tends to overtake the bomber in the matter of superior military characteristics.

If you start a war with a relatively superior bomber as against the prevailing fighter, and the war lasts more than two years, the fighter is bound to out-perform the bomber. Therefore additional defensive fire-power must be provided by escorting aircraft. Such is the role of the escort fighter. With the additional fire-power provided by the escorts, you not only enlarge your aggregate fire-power but also increase the reach of that fire-power. The combined bomber-fighter

force can destroy the enemy's Air Power in the air, and it can also destroy and pin to the ground the opposing fighters which try to intercept the bombing expedition. This relationship between fighter and bomber remains until some new type of bomber comes into existence to offset fighter efficiency -- after which the process repeats itself and the fighter again outdistances the bomber in military effectiveness.

In the next war, no matter how efficient the bomber may be at the outset, we shall not be able to carry out sustained bomber offensives as the war progresses unless we bring escort fighters into play. The fact that single-seat fighters firing only forward were used for escort in the last war does not mean that they will be practical in the next war. They were really a makeshift. The escort fighter of the future will be different; specifically designed for its functions. As a matter of fact I personally designed such an escort fighter and it is a pity that we did not have an opportunity to test it under combat conditions. The escort as I conceived it was not a makeshift but designed for its special tasks. It had extremely flexible fire-power and truly represented a detached bomber turret that could fire in all directions.

**I**NDEED, some experiments in that direction were made during the war. Some of our Liberator bombers were stripped of all extra equipment and additional guns were installed. But the makeshift character of this adaptation lowered performance so sharply that those Liberators were not even able to keep pace with the bombers. Faulty embodiment thus compromised an otherwise correct principle. Obviously the escort fighter should always be greatly superior in performance to the bomber as far as speed and maneuverability are concerned.

The future bomber will have hundreds of millions of dollars worth of atomic warheads in its bomb-bays. It will represent a tremendous portion of national wealth and effort. The bomber will have to go through. And the job of the escort fighter will be to make this possible. That is why it will differ greatly from the makeshift types employed in the past.

Another exemplification of the tactical approach to design is provided by the P-47 Thunderbolt fighter. I

designed and built the prototype of this airplane in 1938, before I left the Seversky Aircraft Corporation, which was then renamed Republic Aviation. It is no longer a secret that I was forced out of the company precisely because I insisted on developing that P-47 prototype. I was accused by the company, and by Washington, of investing company money in utterly unrealistic aircraft. But when war came, it became clear that the design was more realistic than the existing types of fighter. General Emmons' board was created. This board took my fighter plane off the shelf, brushed off the cobwebs and put it into production.

The point I want to make is that this plane answered tactical combat demands because it was not the product of purely engineering concepts; because it reflected tactical thinking. I used my engineering knowledge merely to reduce to practice the tactical requisites as I visualized them in relation to actual combat requirements. I would be more than human if I were not deeply gratified by the comments of pilots who flew the P-47 in combat. They praised the very features of the plane which I incorporated as a direct consequence of the lessons I learned in the last war.

Take, for example, the choice of engine. A great many pilots have praised the air-cooled engine as being practically immune to enemy fire. It was exactly that feature of the air-cooled engine that led me to insist on the Pratt & Whitney double row. In the course of the first World War we had both types of engines, air-cooled and liquid-cooled. Planes with liquid-cooled engines either did not come back at all or came back unscathed. There was very little maintenance activity in their hangars. Planes powered by air-cooled engines returned in a ratio of at least five to one as compared with liquid-cooled. They came back badly damaged, so that their hangars were always humming with activity, but they survived combat conditions.

**I**N DESIGNING a fighter plane I was eager above all to endow it with what might be termed "combat vitality." In that respect my war experience demonstrated that under identical conditions the air-cooled engine had roughly 500 percent more combat vitality than the liquid-cooled type. That was

why, when I discovered that our American pursuit aviation was chained entirely to the Allison engine I decided to break those chains and stick to the air-cooled Pratt & Whitney. Moreover, at the time the air-cooled engine was already developing 2000 horsepower, and I was not impressed with the claims made for the Allison type. I felt sure that those claims would not materialize in time to serve us in the war that was under way.

To increase combat vitality further, I decided to also increase the area of the fighter's control surfaces by 15 percent. This too was dictated by my tactical experience. I remembered that in the first war we had instances where airplanes lost part of their controlling surfaces in combat. They were able to fly back, but crashed in landing due to lack of control at slow speeds. The aerodynamic experts before World War II resisted my modification of control surfaces. They considered it unsound. They argued that it added unnecessary weight and increased the danger of flutter at high speeds. They did not believe an aircraft could be designed to fly with injured control surfaces. They demanded that I reduce my surfaces in line with the "book of instructions." Fortunately a pilot at Wright Field taxied into my plane and chewed off the wing tip and ailerons. Everyone assembled around the damaged plane to see what could be done. I asked for a hack-saw, sawed off a few feet of my wing, aileron and all, jumped into the cockpit and took off for home. That convinced even the skeptics.

Against that background you will appreciate why I am so happy when I hear P-47 pilots assert that they owe their lives to the combat vitality and ruggedness of the aircraft. These features are not accident or guesswork but the result of experience -- the result, also, of close and continuous association with the airmen of our Air Force. I practically lived at Selfridge Field. I used to fly with them to the maneuvers, to Oscoda proving grounds to fire the guns. I know that the prototype of the P-47 would not have been as good an airplane if it were not for the combined efforts of tactician and engineer.

It is with this in mind that I declare that tactical considerations should provide the starting points in planning

the military characteristics of new weapons. I am happy to note that such is the guiding principle at the Air University. This school, of course, has been planned primarily to prepare aerial strategists and tacticians. But, as I have tried to make clear, it is the strategist and the tactician who must take the lead in shaping the new weapons of Air Power. The greater your comprehension of the military science of tomorrow, the closer your weapons will be to reality.

If you are correct in your tactical assumptions, your weapons will prove right in the future without the necessity for proof in battle. Those who create new weapons must realize what the weapons are for. The tactician must analyze the lessons of the last war and interpret them for the conditions of the future. The principles we learned in World War II must be adapted to the new technological conditions. Only thus will we make sure that the newly forged weapons will perform exactly as we want them to perform in actual combat.

But finally we have our own Air University. Now the science of aerial warfare can take definite shape and give our country the scientific background for projecting designs into the future with assurance. Hereafter we shall not merely design racing airplanes with greater range and greater carrying capacity, and then, as an afterthought, see if we can turn them into military planes. With the knowledge gained in the last war, organized into a science in this school, every weapon will be designed for a definite strategic or tactical mission.

Our strategic picture is clearer than ever in the past. If a new war comes, we know the direction from which it will come and the tasks which it will set for us. We are in an ideal position for clear thinking, clear planning and the creation of appropriate weapons.



*Air Power knows no physical barrier--and that is as true for air forces of other nations as for ours.*

-- General H. H. Arnold,  
in *American Legion*  
(August 1947)

# IDEOLOGICAL WARFARE

*Wing Commander E. A. Howell, RAF, (Retired)*

PRESIDENT TRUMAN speaking in March of 1947 said: "The peoples of a number of countries of the world have recently had totalitarian regimes forced upon them against their will." At the time, he referred specifically to Poland, Rumania and Bulgaria. He continued: "At the present moment in world history nearly every nation must choose between alternative ways of life. The choice is too often not a free one." *The Washington Post*, in an editorial commenting on the speech said: "This is breathtaking in its literal implication. It takes into account and is aimed at countering the new technique of aggression. It is as much a tocsin as a policy, a weapon in itself as much as the threat of a weapon."

In fact, most people have been aware for some time that an unseen war is raging in every corner of the globe. In China, Indo-China and Indonesia are fought civil wars of arms. The Moslem world from China to Morocco is seething. In Persia and Palestine racial and religious differences have long been threatening armed conflict. In Europe, there is civil strife in Greece and Poland. In other regions conditions of unrest are manifest. In Britain and America the symptoms of division are to be seen in industrial disputes, which tend to become progressively more and more heated. In Germany and Japan and in many other countries, totalitarian weeds are still flourishing in ground where we wish to cultivate freedom, democracy and peace. Across the world, divisive ideas that set race against race, class against class and creed against creed, are gaining ground.

War is armed conflict between sovereign powers; the aim of war is to secure control over the enemy. In the past, this has been achieved mainly by force of arms. Today, it is being achieved increasingly by force of ideas. Hitler occupied Austria and Czechoslovakia without fighting. The Japanese won a decisive psychological victory in Manchuria. The

cases of Poland, Rumania and Bulgaria, quoted by the President, are more recent examples of similar campaigns.

These ideological assaults are not based on entirely new techniques. Genghis Khan employed the invincibility myth to weaken enemy defenses. Many great commanders have deliberately used similar methods. The religious wars are full of such examples. The campaigns of Napoleon, Nelson and Marlborough provide interesting studies, and the last war is full of these instances on both sides. One time-honored ideological weapon is terror. French children to this day are warned that Marlborough will come for them if they are naughty. Cruelty to prisoners and to occupied peoples has often been used for similar reasons, though it has frequently boomeranged on its proponents.

But these weapons are the bows and arrows of ideological warfare. Today its range of weapons is at least as complete as for any other aspect of war. The weapons operate in every country and in every sphere of every country, so that they reach and touch each home and person. The reason for this emergence of ideas as weapons in recent years lies to some extent in the increasing literacy of ordinary citizens all over the world, which makes it possible to reach them by the printed word through the press and through books of all kinds. The spoken word, too, has been given wings by the use of radios, and the drama has multiplied its psychological value a thousandfold with the development of the cinema. The spread and efficiency of twentieth century communications has opened new doors to men in search of power. And these men have developed weapons in the sphere of ideas equivalent in their effectiveness to the atomic bomb.

Sometimes ideological assault is merely the prelude or softening process before an assault with arms. Hitler's campaigns in 1939-40 in France, Belgium and Holland are excellent illustrations. In other cases, as we have seen, the psychological attack may be sufficient in itself. In any case it has been used by all the totalitarian powers in the last twenty years as their primary means of gaining control over men and nations alike.

THE IMPLICATIONS of this for those responsible for national defense are obvious. In the past, nations have been concerned primarily with armed defense. Now they must also prepare a psychological defense. To do this, what an ideology is and how it operates in what has been called the internal offensive, must be clearly understood. The importance of this can hardly be underestimated, for the liberties of whole nations -- the destinies of mankind itself -- are at stake.

Ideology is the science of ideas. An ideology is a set of ideas which operates as a force to activate and control people. In its simplest form it is an idea charged with passion. Ideas alone can only affect the mind -- and intellectual conviction is but a weak spur to action. The great human forces are seated in the subconscious -- in the emotions. They are born in the heart, rationalized in the mind and expressed in human action. Men are motivated by passion much more than by conviction. For an ideology to be powerful, therefore, it must reach and move the heart. Having done so, it must also provide a focus for the activity it generates. Thus it needs to have three components -- faith, fire and focus -- a philosophy to convince the mind, a passion to move the heart and a plan to occupy the activity.

With those components an ideology becomes a world force, because it mobilizes men to organized action for or against it. It has universal application because human nature is universal, and it is rooted in human nature. Its plan ensures that the activity it generates flows into organized channels with a common aim in view.

No geographical, racial, economic or military walls can keep out an ideology. Ideas penetrate all material barriers; and they can be expressed in many forms and carried in a variety of vehicles. The expression and carriage of ideas is a new art of war in the modern age, and the mobilization of hearts and minds can be of as much importance to military victory as the mobilization of armies.

The ideologies which have swept across the world in recent years are new forms of old ideas. The idea of the super-race, from which Germany and Japan derived their strength, is as old as organized men. The superclass is

another modern form of an ancient myth. Men moved by emotion are not objective; the weakness of the Nazi philosophy, which must have been apparent to countless thoughtful citizens, did not matter when the masses ceased to be unbiased and desired passionately to believe it. A little faith is bolstered by a big fire. Inconsistencies are easily rationalized and hidden by powerful wishful thinking. The concentration camps and secret police, the injustices and tyranny, the sufferings of millions which occur wherever dictatorships flourish, are readily overlooked by the eyes of men blinded with bitterness or with the desire for power and position for themselves and for their nation.

People who see these evils clearly frequently acquiesce in them through fear of the consequences if they do not, and most dictatorships dispose of expressed opposition ruthlessly. Every society is made up of the convinced, the acquiescent, the indifferent and the dissident. If the convinced are ruthless, the acquiescent appease, the indifferent follow, and the dissident are eliminated. A fundamental difference between a dictatorship and a democracy is in how each deals with opposition, one persecutes and the other tolerates; dictatorships eliminate opposition, democracies outvote it.

It is difficult to define dictatorship, or democracy, or tyranny, or freedom, or any of the other key words in an ideology. Democracy is government of the people, by the people, for the people. But totalitarian governments always claim to represent the people, and freedom is a word of many meanings. Freedom for what? To do as we please? That leads to anarchy. To do as we ought? Or to do as we must? When does freedom end and tyranny begin?

In practice there is no such thing as absolute dictatorship or absolute democracy -- both are relative. Every democracy has to employ some coercion and every dictatorship allows some freedom. The ordinary laws of every country have to be enforced and the ordinary man of every country has to *feel* that he is free. Nevertheless the differences are real and vital. Dictatorship aims to control while democracy aims to free. Society depends on teamwork; democracy believes in teamwork by consent, dictatorship in teamwork by coercion --

hence the purges and secret police. Democracy depends on people being unselfish, dictatorship on people being frightened. Dictatorship is based upon an ideology of demand, democracy on an ideology of give.

**WHEN** PEOPLE are motivated by a demand -- to obtain something they do not have or to retain something they do have -- and translate that demand into behavior, the result is the age-old clash between the Have-nots and the Haves -- the Grabbers versus the Grippers. One is largely impelled by greed and the other by fear, though greed and fear are present in both. These are deep-seated and powerful human emotions; their development leads to bitterness, bitterness to hatred and hatred to war -- the war of the revolutionary versus the reactionary, so-called left versus so-called right. The German and Japanese exclusive nationalism was born from the emotions of the dispossessed and reared on the ambitions of the greedy. Marxist exclusive internationalism derives its power from the same source.

To focus a philosophy of demand into political action a common human failing is employed; the technique is to blame the wrongs of the many on a selected few. This discriminatory practice is as old as mankind. It is always more satisfactory to blame someone else than to accept any personal responsibility for injustice. Marx blamed a class for all the evils of society, Hitler blamed a race, both mobilized millions in fierce ideological wars. Every dissatisfied man or woman is a potential victim of this practice. And who is completely satisfied -- all the time? That is why a philosophy of demand will always strike a chord in every breast and begin to create division among people; division develops into bitterness, and bitterness into anarchy or war.

Discrimination flourishes on dissatisfaction, and becomes acute when dissatisfaction grows into resentment. Countries in which there are good grounds for resentment are the most liable to fall under psychological attack. Lenin mobilized the discontent of the oppressed masses in Russia; Hitler fanned the bitterness of a defeated nation into the fanaticism of Nazi Germany. Today, the countries in which there is most reason for discontent are often those in which

ideological conflict is most advanced.

When people are motivated by the wish to give, and behave accordingly, the result is the reduction of discontent and the development of a free democracy. Unity between people is fostered by each caring for the needs of the other; it is the opposite process to the divisive action of a philosophy of demand. The degree of democracy possible in any society is directly proportional to the degree of unselfishness of the people; this is the strength as well as the weakness of democracy. Democracy is a balanced organism where dictatorship is a rigid organization, it is a spirit rather than a rule. This means that it is capable of working better, since really good teamwork cannot be enforced -- it must spring from the spirit of the people who want to work together. Society depends upon human relationships; democracy develops harmonious relationships; dictatorship, forced relationships. If teamwork is not achieved by free will, it must ultimately be enforced, or there is anarchy. It requires motive force, and this can be any of the great human motives -- love, fear, greed or hate. Democracy believes that teamwork can and should normally be obtained by tolerance, while all dictatorships rely ultimately on teamwork through fear. Totalitarianism accepts human frailty and imposes the fear motive, democracy believes in human change of heart and encourages people to co-operate because they choose to of their own free will. Democracy and freedom go hand in hand.

Under a philosophy of demand, exclusive nationalism and internationalism are developed, whereby race is set against race and class against class. Under a philosophy of toleration, supernationalism flourishes. Nationalism can be a selfless and unifying force in a world community when it is inclusive -- where it visualizes the inclusion and benefit of all mankind in its aims. Supernationalism is inclusive nationalism and it is the natural program of anyone who loves his country and wishes everyone outside of it to participate and benefit with him. It is the Western tradition of statesmanship in every democracy, and the best of our leaders in Britain and America have held to these ideals in developing the Commonwealth and the United States. It is the

principle of the family of nations held together by community of spirit rather than by pacts and treaties.

**A**N UNDERSTANDING of these fundamental principles is necessary to a study of the present world clash of ideologies. In every country determined groups of men are at work propagating philosophies of demand of one kind or another. The aim in every case is the same -- to gain control in the country concerned. As a result of these activities a world-wide trend is observable wherein each country is tending to divide more and more definitely into right and left. Extreme groups are gaining numbers by accusing all who are not wholly with them of being against them, in this way the middle disappears; it is a process of human fission which is much more dangerous than atomic fission.

Some say right is wrong and left is right; others that right is right and left is wrong, and many say right is right and left is left and never the twain shall meet. The real clash, however, is not between right and left but between the right and wrong in both -- it is not who is right but what is right that matters.

The basic question is thus an ethical one of right and wrong. And here one is driven to take sides. There can be no armistice with injustice, peace is the total victory of right over wrong. Here, the materialist is at fundamental issue with the idealist, because right and expediency are not always the same. In such cases the idealist cannot compromise because compromise with wrong is defeat for right. Materialism accepts expediency and undercuts the basic faith of democracy, damping its fire. The spread of materialist thinking and living in the democracies is the reason why democracy's ideology is less active than the ideologies of demand, and this is its greatest danger, for it leaves the field open to the enemy.

A psychological offensive aims to make an ideology dominant in the society against which the offensive is directed. As in other military operations there is a method and a plan by which the aim is achieved. This plan is basically the same for any ideology. It can be divided into four phases:

(1) The general bombardment of people with ideas. This

is the cultivation of the soil for the ideological plant.

(2) The capture of the psychological channels (press, radio, films, etc.)

(3) The capture of the focal points of power (government, fuel, transport, utilities, police, etc.)

(4) The consolidation of gains.

Since ideas cannot be interdicted by normal barriers, all four phases are usually put into operation simultaneously. The offensive is developed into a weapon charged with the high explosive of an ideology -- its passion. Every possible form of the basic idea is repeated through the press and radio, speeches and personal contacts, books and magazines, pictures and music, plays and films. In time, by the continual impact of ideas charged with passion, the minds and hearts of people are affected. They tend to become more and more fired by the passion, convinced by the philosophy and active in the plan. Finally some are captured, body and soul, and become the nucleus of the ideology.

Like an armed offensive, a psychological offensive has its strategic and tactical phases. The strategy is concerned with the over-all direction and focus of the offensive and the tactics with the detailed use of weapons to assault specific objectives. For example, there is a clearly marked strategy to create division between Britain and America. In the tactical phase this takes the form of an assault on the uniting factors of culture, economics, religion and world policies.

The ideological strategy should be and usually is closely linked with the grandstrategy of the nations concerned. The psychological assault in the Middle East -- designed to create division there -- is linked strategically with the control of oil and of world sea and air communications. Britain has always had a vital interest in preserving the freedom and stability of the Middle East because of her Commonwealth communications and now, more than ever, because of oil. Any potential military threat there is a threat to the life of the British Commonwealth. Today, that threat exists in the ideological assault now raging whose fruits are so evident in Greece, Persia, Palestine and Egypt and whose activity has now drawn the United States into action.

Incidentally, a revealing comment was made on President Truman's speech in an editorial of the British Communist paper, *The Daily Worker*. It said: "Wall Street is about to take over Greece and Turkey . . . which . . . are now to become Colonial appendages of the United States." In each case, as the division sown is reaped in anarchy, there is the opportunity to present the ideology of demand as a way of life which answers the problem. Difficulties arising between Britain and America are attributed to the capitalistic system or so-called "dollar diplomacy," and troubles in Palestine and elsewhere to "British Imperialism." Always, the suggestion is that the troubles would not have occurred with, or would be righted by, a totalitarian way of life such as communism. The successful propagation of this fallacy is the road to power for the groups of men who serve and invent it.

**A** TYPICAL EXAMPLE of the use of an idea in this way is the case of the Anglo-American loan issue. This was developed on both sides of the Atlantic as a psychological weapon to divide the two great democracies. Americans were encouraged to think that the loan was to assist "British Socialist Imperialism." In Britain it was represented as a clever move on behalf of "capitalistic Wall Street." These two simple fallacies were invested with the bitterness of anti-British or anti-American feeling, and were so assiduously propagated that they did tend to divide the allies. This controversy over the Anglo-American loan was, of course, only one of many such weapons designed to accomplish the same objective. The division of Britain and America is one of the great strategical aims of the anti-democratic forces. The merits or demerits of the loan or of any other issue may be argued, that is not the point, but its use in this way to divide friends is typical of the ideological assault.

An interesting feature of this type of weapon is that it can be used by anyone. Most of the people who propagate an idea are unconscious vehicles for the ideology. They would object strongly to being identified with the whole philosophy, but they will subscribe sincerely to some facet of it which appeals to them. These are the so-called 'fellow-

travelers' and it is through the activity of countless such people that an ideology flourishes. In the example mentioned, very few of the people who took part in the controversy over the loan would have done so if the objective had been clearly understood as aimed at creating feeling against the other country. The loan itself affected most people financially, and was thus the object of keen controversy, which was easily developed into a focus for ill-feeling. It is simple for any organized psychological force of the right or left to transfer sincere opposition to a thing into bitter opposition to people connected with the thing. In this way an intellectual objection becomes invested with emotion and the result is an ideological weapon directed against people.

It is plain that although certain broad principles apply to all psychological offensives, the application of them varies according to the nature of the ideology. Totalitarianism believes in the means justifying the end. It can therefore be ruthless in the employment of its weapons and it inevitably becomes unprincipled as the struggle develops. The Japanese openly employed pornography and drugs in their internal offensive in Manchuria. Hitler was less open with such methods but used them none the less. Others employ them also. Lies, according to totalitarian standards, are only wrong if they fail in their objective; the internal offensive is waged according to the ethical standards of its directory.

This being so, there is clearly a fundamental difference between the weapons used by one side or another which is directly related to the principles to which they subscribe. It is the old clash between expediency and principle, and here, the democracies' strength is that they stand absolutely for principles. The superficial view is that this is a source of weakness but, in fact, if rightly exploited, it binds men of principle together as nothing else can. The weapons which the democracies use are the uniting influences between people, their consideration for one another in their homes and in their community and their common beliefs and interests, cultural, religious, social and economic. These influences are the raw material from which the weapons are forged. The dictatorships on the other hand tend to employ the divisive influences of bitterness, fear and greed.

Applied to a specific idea in the press or radio, or through any other psychological channel, these influences become potent weapons for activating people in one direction or another. A newspaper becomes a machine gun firing a steady stream of ideas at the minds of the masses. Given equal rates of fire and range, the "gun" which fires the most penetrating bullets has the greatest effect.

**T**HERE IS NO ultimate defense in psychological war, attack is the only effective defense. Once an idea has been forged into a weapon and fired, it cannot be prevented from reaching the minds of the masses. It can only be hindered or delayed or temporarily warded off. The most that can be done is to deny as many channels of expression as possible to enemy ideas. In totalitarian countries this is the reason for the censorship of the press, and other forms of free speech. But such methods are an admission of failure because an idea is ultimately defeated by a better idea. It is only those who fear better ideas who have to resort to censorship and control. Censorship and counter-propaganda are effective for a time, and they can greatly delay the ultimate victory of the better idea. Misrepresentation and lies ultimately boomerang on their users; for truth is stronger than fiction, and the channels are too numerous to be completely blocked.

Ideas can be disarmed of much of their power if they can be shown to be wrong or enemy ideas. But the most dangerous propaganda strikes unseen and unrecognized. If enemy ideas can be detected they can be defeated by contrast with better ideas, thus this is a battle of wits, but even more a battle of societies.

The detection of enemy ideas is relatively easy if one is clear as to the basic philosophies involved. This in turn requires an appreciation of ultimate right and wrong, because an ideological clash is not just political or economic or social but always in the end an ethical clash. Certain simple questions, applied to any expression of ideas, reveal their ethical sense and give an indication as to which basic thought-pattern they belong. Does this solve or exploit the problem? Does it cure or use the grievance? Does it reduce or magnify the friction? Does it decrease or increase the

difficulty? Does it sooth or aggravate the bitterness? Does it help or hinder teamwork? Does it divide or unite? Questions such as these expose the ideological barb in most ideas, and reveal an extraordinary scene when applied to almost any daily newspaper. The majority of the ordinary issues dealt with in the daily press carry a divisive punch hidden in them, in most cases unrecognized even by the writer.

When the products of the major psychological channels are examined in this way, another common fallacy is exposed. Many people believe that an ideology is just politics, whereas the truth is that it is at the root of all politics. It produces a way of life of which politics are the expression of only one facet; it is a spirit out of which politics are born and by which they are driven; it causes people to live a way of life in that spirit.

An ideology is as universal as human nature itself and its battleline runs through every individual human being. Everyone is liable to support a philosophy of demand even though he may subscribe to a philosophy of give, since this is the classic battle in human nature for the emotions latent in everyone. The basic ideologies are to be found in both Socialist and Conservative Parties, among Democrats and Republicans, and in every political party, because politics are not the basic divisions between men. In totalitarian countries, however, politics and ideologies are closely integrated. Membership in the Nazi Party usually meant that the member consistently supported, believed in and lived the Nazi philosophy. The same is true of other dictatorships and single party systems such as those of the Communists. It is part of the consolidation of psychological victory to keep the reins of power exclusively in the hands of convinced ideologists.

**POLITICS** IS only one sphere of operation of an ideology; every area of the nation's life is affected. The rival philosophies of demand are especially active in industry, where the organized divisive activity of the Communists produces strikes and lock-outs with increasing bitterness on both sides. The war is liable to rage most fiercely in the key

industries such as coal and transport, since breakdown in these brings all industry to a standstill. The repercussions of industrial war are felt immediately in the services through shortages in supply -- the industrial front is as important as any other in modern war. The services must be concerned more and more with the security of their supply arrangements, and security measures must include an ideological program if they are to be effective.

From all this it will be seen that those concerned with national defense must consider several aspects of psychological warfare:

(1) They must make an estimate of the world ideological situation and relate it to national strategy.

(2) They must evaluate the enemy offensive and plan an adequate counter-offensive together with such defensive measures as are possible.

(3) They must maintain and train adequate anti-espionage and anti-sabotage forces.

Ultimately, there is no aspect of national or industrial or individual life which is not a part of the psychological battlefield. An ideology starts with the individual's beliefs and conduct; it goes on to home life -- the rock on which every nation stands; it takes shape in industry as a force for or against teamwork; it moves into national affairs to fight for control of the national life and it permeates every nation as a world force bidding for the allegiance of every last human being.

Field Marshal Viscount Montgomery, in an address on military leadership, has said: "The manner in which war is waged varies from age to age and with the advent of each new weapon. It is a constantly changing, constantly evolving thing. He who aspires to high command in war must thoroughly understand the main principles which will dictate the manner in which the battle of his age will be fought; he must also be constantly on the watch for new ideas or new weapons which will affect those principles."

We are at the beginning of a new era in warfare where the psychological weapons may be even more decisive than the atomic. The battle of our age may yet be won in the realm of ideas even more than in the realm of arms. The trends are

obvious for everyone who wishes to see them. This is predominantly an era of wars and industrial and civil unrest. Stability and peace will come not through pacts and committees, however necessary these may be, but through men and nations choosing a common way of life. Which way of life will they choose? Will it be one based on a philosophy of demand or one based on a philosophy of give? Will it be dictatorship or democracy? The psychological war may decide!

At the American Army Command and General Staff School last year the Commandant, Lieutenant General Gerow, addressing the officers said: "There is nothing that happens in the world today that does not affect the problems of peace and war, as well as the well-being of our nation. The trends and thoughts and conditions throughout the world today affect both civilian and soldier. If we as soldiers understand the underlying principles that influence the thinking of the people of the world, we will be much better qualified to do our job."

Defense requirements for the democracies call for an intensive study to be made of every aspect of psychological warfare. Democracy has potentially the most powerful of all ideologies, but we must appreciate this and learn how to fight with it. The defeat of freedom in country after country has not been finally arrested by victory over Germany and Japan; the tide of tyranny will only be stopped and turned when the force of freedom, its philosophy, is developed and applied. Democracy must be armed with its inspired weapons, and its people must be trained, as a matter of urgency, to fight with them in the realm of ideas. If they fail, or start too late, it may be that a third world war will drag the democracies to crushing defeat and extinction.



*In case of another World War, we should contemplate the possibility of the victor ruling the whole world.*

-- William F. Ogburn,  
in *Air Affairs*  
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# TRANSONIC AERODYNAMICS

*First Lieutenant William J. Rand*

**H**IGH SPEED flight is today faced with certain problems which are largely inherent in the fundamentals of aerodynamics. The basic requirements for control of an airplane are specifically concerned with providing the pilot with a means of bringing the airplane into equilibrium or balance at any angle of attack from at least zero up to the stall, control for maintaining zero sideslip during all flight maneuvers and a control over the angle of bank for turning flight.

These controls are provided by the elevator, the rudder and the aileron respectively. There is, however, a second requirement in the aerodynamic design of the airplane whereby once the airplane is brought into an attitude desired by the pilot, it must tend to remain in this attitude and inherently resist disturbances that tend to destroy this equilibrium. This characteristic of resisting disturbance is called static stability, and is essential to the proper operation of the airplane. In order to point up the requirement for adequate airplane stability or its tendency to stay put when placed in equilibrium on some desired flight path, it is only necessary to realize that the airplane when flying at extremely high speeds, and consequently at very small angles of attack, can tear itself to pieces in less than a second if the angle of attack is inadvertently allowed to increase due to any disturbance whatsoever.

Stability is always required of any controlled system if the response of this system to disturbances is faster than human reactions. Boats, for example, are essentially unstable, but with no disastrous results because their rate of divergence is so small that the human pilot can easily keep ahead of the motion. However, a fast airplane reacts so swiftly to small disturbances of any sort that it is essential to have opposing forces developed inherently in the airplane rather than to count on the pilot to apply control

in order to maintain the equilibrium. This stability is desirable then from a safety viewpoint as well as for making a "nice flying airplane."

Stability and control are closely related, and more or less oppose each other, being functions of the location of the airplane's center of gravity. As the c.g. is moved forward the aircraft becomes more stable in that it has more tendency to return to a given flight path when deflected by outside disturbances. If the nose is pushed up in rough air this stable condition will cause the airplane to settle back to its original angle of attack. As the c.g. moves aft this becomes less true until a point is reached where there is no resistance to change. Any deflection of flight path will result in a permanent change of direction for the airplane. Moving the c.g. still farther aft will cause violent instability and any small disturbance will be amplified by the airplane itself. Imagine a condition such as this in rough air! It can be appreciated, then, that considerable care must be exercised in design of aircraft to insure that stability is maintained throughout the most extreme normal movements of the c.g. in flight due to fuel consumption, load variation, etc.

It is also apparent that the Weight and Balance Officer at an airfield is not just someone who occupies so much space, but is actually a very important person. He is the man who keeps you from putting that extra weight in the rear and then having to fight the airplane from take-off to landing if you are lucky enough to get off the ground at all. From the foregoing, the question might be asked, "Why isn't the c.g. moved so far forward that the airplane is extremely stable under all loading conditions?" The answer lies in the interrelation between control and stability. For example, an airplane might be in balance at an angle of attack of  $5^{\circ}$ , which might correspond to a flight speed of 250 miles per hour. If the pilot wishes to bring the airplane into equilibrium at 100 miles per hour or set at a  $15^{\circ}$  angle of attack, a control must be applied that will overcome the nose down stability moment. Obviously, the more stable the airplane, the more control will be required; and as the amount of control that it is possible to get is limited, the

amount of possible stability is limited, thus, restricting the forward movement of the c.g.

AN IMPORTANT way in which airplane stability is felt by the pilot is through the force incurred in maneuvering the airplane on accelerated flight paths. It is necessary that the force required of the pilot to maneuver the airplane be neither so heavy that it becomes tiring to control the airplane nor so light that the pilot can inadvertently accelerate the airplane past the design load factor and cause structural failure. These forces are termed stick-forces or "stick-forces per g," and will become heavy through a forward shift of the c.g. and light when the c.g. is shifted aft. If the c.g. is moved far enough aft, the stick-force may go to zero; and this zero point or any c.g. location aft of this point makes flying very hazardous.

The Army and Navy specifications set very definite limits for stick-forces throughout an airplane's c.g. range. For fighter aircraft this limitation is most important and specifications call for a maximum of eight and a minimum of three pounds per "g". This would give 56 pounds of pull-up force in an eight "g" pull-up using the maximum gradient and 21 pounds for the same pull-up using the minimum. Gradients higher or lower than these have been proved objectionable by extensive flight testing. The major restriction on the forward c.g., besides the maximum allowable force-per-"g" gradient, is the elevator control necessary to land the airplane. This condition is nearly always the critical condition for elevator power and definitely limits the maximum stability level of the airplane.

Having considered the interrelation of stability and control of an airplane in a vertical flight path, let us examine rolling control or the aileron. The major problems of roll control are, first, to get enough aileron control moment and second to lighten the necessary pressure through aerodynamic or other forms of balancing, so that the pilot can deflect the aileron at high speeds.

At the beginning of World War II normal fighter tactics seemed to be based on the Lufberry Circle principle wherein the dogfight was usually won by the airplane with the shorter

turning radius. It was soon realized, however, that this type of circling maneuver was no longer satisfactory and emphasis was placed on higher and higher rates of roll in order to gain advantage in breakaway maneuvers.

As requirements for rates of roll demanded of fighter aircraft were raised, aileron design became a correspondingly greater problem. One partial solution consisted of decreasing the airplane's span, since obviously a large airplane cannot roll as fast as a small one. The short span fighter or one with a small aspect ratio, which is the ratio of span to mean chord, could not only roll faster, due to its shorter span, but generally flew faster because of reduced drag; and since roll rate is a function of speed, this also was helpful. There is a speed, however, beyond which the pilot will not be strong enough to hold full aileron and then the rolling velocity begins to fall off.

The problem of designing higher performance ailerons is a very difficult one, especially in making them light enough to deflect at high speeds, yet structurally strong. In several instances the balance difficulty has been so great that the airplane designers have resorted to hydraulic boosters to help the pilot move the aileron. Such a booster has made the P-80 the fastest rolling airplane known in the world today.

**N**OW, LET US investigate some of the specific problems encountered in high speed flight. Until about the middle of World War II, airplane designers were confident when they designed a new model that they could calculate its speed and other characteristics within rather narrow tolerances. An error of over five miles per hour in calculation of maximum level flight speed was considered excessive. Then something went wrong. Fighter top speeds were off by 100 miles per hour and, what was worse, fighters in terminal velocity dives from high altitude experienced violent buffeting and pilots were unable to pull out until controls suddenly became effective at low altitudes, sometimes too low.

None of these things had happened before and obviously something had to be done about it. From the intensive research that followed much was learned about the three speed

regions known as subsonic, transonic, and supersonic. Aircraft had heretofore flown in the subsonic region entirely, where the formulas for drag and lift and thrust worked quite well. Now, however, airplanes were venturing into the upper limits bordering on the transonic, and all was not well. Why, when the same indicated airspeed was held throughout dives, did controls suddenly take hold nearer the ground? With the answer to this question came a new term: *Mach number*, defined as a ratio of the velocity of a moving body to the rate of propagation of pressure waves in any fluid medium. In other words, velocity over the speed of sound. Now, the speed of sound varies with the absolute temperature of the air, and follows the variation of the latter with change in altitude. In air the speed of sound varies from approximately 762 miles per hour at sea level to 660 miles per hour at 35,000 feet. A Mach number of 1.0, therefore, is a velocity equal to the speed of sound, and varies greatly with altitude. Our fighters were very near this unpredictable  $M=1.0$  in their high speed dives at 25,000 feet, but at 10,000 feet they were traveling at a much lower Mach number, since the sound was traveling faster.

At speeds considerably less than the speed of sound a flow pattern is obtained whereby air is deflected smoothly in front of a body, thus flowing around it without much disturbance. The body in this case "warns" the air that it is approaching by means of pressure waves that travel at the speed of sound. When the air so warned reaches the body it separates and flows around it, coming together again when the object has passed. This flow is made smoother by drag reduction or streamlining. Instead of the old Spad with its cross wires and fixed undercarriage, we had the P-51 with its clean lines, thin wing, and retractable gear. Drag was a major factor and had to be constantly reduced, which it was. Everything was fine. But now our "body" begins to travel at speeds greater than that of sound, and overtakes its small warning disturbances. Therefore, it suddenly comes against a wall of air through which it must force its way. The disturbance set up by this body at supersonic speeds is known as a shock wave. Across this disturbance abrupt changes in air temperature, speed and pressure occur, causing losses in

energy which are converted into heat. Rapid rises in airfoil drag coefficient begin to occur at the critical Mach number of the airfoil, which Mach number is defined as that at which local velocity is equal to the speed of sound. At this same Mach number or sometimes slightly higher the lift coefficient falls off abruptly, causing a change in pitching moment. These fluctuating force and moment coefficients in the transonic region present grave stability and control problems, and make flight at these speeds very difficult. This is what has been termed by some the "sonic barrier," and as yet no practical solution has been demonstrated for flight in this transonic region.

Many theories are now being advanced for minimizing these transonic effects and for controlling flight through the transonic region into the supersonic, where flow at all points on the body is above Mach=1.0. Here, it has been predicted, the subsonic calculations will to a fairly large degree hold true.

Among these theories are further streamlining, since it seems logical that the cleaner the airplane aerodynamically the less will be the drag rise at the critical Mach number. Also, since the airfoil must force its way through the air, the leading edge should depart from the old high lift type with its bulge and become thin and sharp. The wedge or diamond cross section has also been suggested and is being studied. The suggested wing configurations are, in addition to the rectangular type as used on the XS-1, the swept forward and swept back designs.

**T**HE EFFECT of sweep is to delay the advent of compressibility rise and reduce the magnitude of the peak drag coefficient near  $M=1.0$ . At a Mach number above .8, for example, considerable increase in speed can be accomplished for a given size airplane and power plant by the use of a swept back wing. Theoretically, the greater the sweep angle, the greater the possible speed before encountering undue drag rise. This speed gain must be sufficient to compensate or the structural weight penalties and undesirable low speed characteristics of the swept back wing. In the case of

the swept forward wing, the additional weight required to make the wing strong enough to be safe at high speeds more than offsets the speed advantage. It seems that this type will not at present be brought into general use. The swept wing in general has a higher stalling speed than a straight wing due to the lower possible maximum lift coefficient obtainable, and undesirable tip stall characteristics of the swept wing further complicate control in landing.

Of course, all of these are theories -- ghosts, because we have not been able to physically feel the sort of thing our slide rules and small scale test data tell us. Remember in high school algebra that once one had set up the equation for Anne's age, her brother's temperature and the length of the rope the solution for how fast the train was traveling was simple! That is precisely where we are today. We are trying to set up the equation.

Some of the factors that we are certain will fit into the eventual equation for transonic and supersonic flight are structures, aerodynamic shapes, control, propulsion installations, materials, armament and escape provisions. One of the biggest problems in structural considerations is the increase in loading with a sizeable decrease in space to absorb these loadings. As an example, the P-80, which travels about fifty percent faster than the old P-40, must absorb approximately 300 percent as much load in approximately the same dimensional space. In another example, the wing skin thickness in the aircraft of the last world war seldom exceeded  $1/16$  of an inch, whereas skin thicknesses of half an inch seem necessary at present. Wings, which to date have seldom been less than 15 percent thick, should not exceed six percent thick if supersonic speeds are to be realized.

The aerodynamic shape of transonic and supersonic aircraft will probably bear only a vague resemblance to contemporary aircraft. In addition to the sharp leading edges, it appears that the transonic airplane will have wings and tail surfaces swept back very much like the paper darts that Junior makes with your favorite sports page. The wing of the supersonic airplane, what there is of it, will probably be of very low aspect ratio, that is, the span to chord ratio

will be in the order of two to three. The fuselages and nacelles will be extremely long for their maximum cross sectional dimensions and will be as free of protuberances as possible. Such things as windshields, radomes, turrets, and antennas will have to coincide with the aerodynamic lines. Present indications are that horizontal tail surfaces, where used, will be set exceptionally high if not on top of the vertical tail surfaces.

From the standpoint of controls, our wind tunnels warn us of some rather severe control force reversals, i.e., the pilot will have to pull on the stick to get the nose down and push to get it up. Another decided problem of high speed flight has been what we call snaking, wherein the airplane oscillates violently directionally. We began to experience this with our P-51 and were able to correct it. The P-80 then showed the same tendencies and we have again been able to overcome it. Ailerons have been another source of control problem where they vibrate at extremely high frequency and fairly high amplitude. We have been able to label this "buzz" in spite of the fact that we are not yet too certain as to its cause. Most of these and similar control problems can be managed by the use of irreversible control systems. A disadvantage, however, of irreversible and/or power controls is that the pilot is robbed of feel of his airplane. A very serious problem is to work out a method of feed back force so that pilots will not be able to change their course of flight so rapidly that catastrophic accelerations are applied to the aircraft structure.

**T**HE PROBLEMS involved in the installation of propulsion units are most challenging in high speed flight. As mentioned previously, with more aerodynamic design the airplane tends to shrink in size. At the same time, power demand is increasing. When placed above or below the wing the power plant installation involves intersections that cause tremendous drag rises with increase in speed. We have tried design studies with the propulsive units at the wing tips and they look quite promising on unswept wings, but from German data they cannot be tolerated on a swept wing. Where

the number and/or size of units permits, it appears that the fuselage is the ideal spot aerodynamically for the engines, since it does not increase the number of intersections and raises the volumetric efficiency of the fuselage. Some of the disadvantages of propulsive units in the fuselage are first, the installation of satisfactory inlets without compromising vision and other functional requirements in the forward portion of the airplane and second, the long length of exhaust pipes, which in addition to being a fire hazard, reduce the effective thrust.

In connection with propulsive system installation, fuel also is introducing problems due to space limitations. It seems odd to hear an airplane designer who has always been most weight conscious say, "I don't care what the fuel weighs, just so it doesn't occupy any space." Of course, as the speed of airplanes increases the fuel burned per unit of time or distance also increases. As a result of the increase in fuel requirement the size of our aircraft is mounting in leaps and bounds to maintain range. Fighters that have been weighing 10,000 to 15,000 pounds are now approximately 20,000 to 30,000 pounds and bombers of approximately 100,000 pounds are near 200,000 pounds. Some idea of fuel consumption in missiles can be obtained from the German V-2 which burned nine tons of fuel in a little over one minute in delivering a one ton bomb approximately 200 miles.

The problems of materials might be grouped into the conventional strength-weight relation except that temperature considerations must also be included. Turbo-superchargers, turbines, compressor blades, combustion chambers and rocket jet materials are of extreme importance. Much work has been done and is being continued on both ceramic coatings and internal cooling to assist in withstanding stress at elevated temperatures. Regardless of how successful these experiments are there will still be a need for research on basic materials that will tolerate still higher temperatures if we are to realize an increase in thermal efficiency. Materials of construction are also being given a thorough study from a temperature standpoint. At speeds two or three times the velocity of sound, outer skin temperatures of 300 degrees Fahrenheit to 600 degrees Fahrenheit are anticipated. Of

course, in addition to the structural materials, insulation for temperature and sound, transparent material of high heat and impact resistance, and textiles of both high strength and heat resistance are also being studied.

Armament, another very important item in our formula, will also cause some sleepless nights and bald heads before a satisfactory answer for higher speeds is obtained. The air loads on any exposed barrels and launching tubes will be too large to be tolerated. The exposed barrel of a present .50 caliber machine gun will deflect three miles when pointed crossways to the flight path at a speed of 400 miles per hour. At firing rates as high as 1,000 rounds per minute, two rounds of ammunition per weapon are the most hits that can be made on a body 50 feet long if it is traveling at 500 miles per hour at right angles to the flight path of the projectile. As mentioned under materials, when high speed aircraft are built of high strength thick gauge material the lethal load required to dispose of an airplane will be much greater than any contemporary machine gun fires. The problem of armament suggests the following conclusion -- just as the world needs a good nickel cigar, the high speed tactical airplane requires a power operated device capable of automatically dispatching a high lethal charge with several miles range, installed in a carrier that sniffs its way to within a few inches of the vulnerable spot of a target. Furthermore, at no time during its operation may it be extended beyond the normal lines of the airplane, and it must occupy a minimum of space within the airplane.

**T**HE LAST of the factors that must go into our formula is escape from the high speed aircraft, a problem which is one of our biggest headaches at the moment. You have probably read about and are familiar with the procedure of seat ejection whereby the pilot or other members of a crew can be thrown from an airplane. This system appears to be the answer for speeds of 400 to 500 miles per hour. At higher speeds we are reasonably certain that the human body cannot withstand the dynamic pressures or accelerations. Our problem then is to have a capsule or portion of the airplane that can be

separated from the airplane at all speeds, altitudes and attitudes of flight and that will safely lower the crew members, without any tumbling, to an altitude and speed where they can finish their trip to the ground in a conventional manner. As a final touch we would like to have our capsule deliver its cargo all the way to the surface and be equipped with liferaft, radio, stoves, rations, bunks, etc.

Much work is being done on solving these problems, but to materialize the ghostly theories so that they can be applied to the problems will take time and new test equipment. The elaborate test equipment systems for use with aircraft, as we know them today, do not work with tomorrow's supersonic craft. The supersonic wind tunnels now in existence are inadequate for tests of full scale models, and because of transient shock waves in the small tunnels, transonic flight calculations are impossible at present except when made in free flight. There have been some tests made with missiles telemetering data back to the launching site, and with very small airfoil sections suspended in the airflow pattern over the wing of a P-51 in flight, but these have not been, for the most part, particularly successful in providing accurate research information.

It is apparent that much of the general opinion as regards supersonic flight is in error. A great deal of research and development remains to be accomplished. A war fought now or in the near future would almost definitely begin with the weapons available at the close of World War II. Although contracts have been let for production of many new flight articles, emphasis must be placed on many seemingly dry and unimportant subjects, such as studies of the upper atmosphere, airflow patterns at Mach numbers of from about .9 to perhaps 7.0 or 10.0, and human reactions at high speeds or great acceleration. The United States has long been relying on a backlog of basic research conducted five to twenty years ago and if we plan to survive in the scientific age of the present and future, we will have to pull our heads out of the sand of false security and embark upon a program of research such as the world has never before seen.



# MILITARY ACTION PRIOR TO DECLARATION OF WAR

*Colonel Louis E. Coira*

**I**N THE MONTHS since V-J Day many military and civilian leaders have prophesied the nature of possible future wars. Almost invariably the prognosticators have expressed three assumptions: that the United States will absorb the opening blow of a future war; that this nation will be attacked by an aggressor before attacking any other nation; that the first blow, if successful, will result in chaos. While the latter two assumptions appear to be valid, the assumption that this nation must necessarily continue in the future as in the past to absorb the first blow before committing its armed forces is not only unsound but unless challenged might risk the ultimate survival of our nation.

The destructiveness of modern war, disregarding the future possibilities of military technology, makes it imperative that the security of this nation not be jeopardized by an outmoded concept of government which will not meet the requirements of national survival in this modern world. Although the framers of our constitutional government could not possibly have foreseen the conditions of the modern world, nor the position of the United States in that world, it will be shown here that the evolution of constitutional law permits commitment of our armed forces in any offensive-defensive action which public opinion will support, even prior to a declaration of war by the Congress of the United States.

The supreme law of the nation, the law to the support of which all civil and military servants of the nation are obligated, is vested in the Constitution of the United States. It is the basis of authority for all military action, and as such must be studied for the resolution of the problem of who is authorized to commit the armed forces. That document specifically states:

"The Congress shall have power ... to raise and support armies ... to provide and maintain a navy ... to make rules for the government and regulation of the land and naval forces."

Under the authority thus conferred, Congress stipulates the numbers and kinds of troops to be enlisted and the method of recruiting, authorizes the building and manning of war machines, provides for installations such as camps, arsenals, dockyards, and airdromes, and appropriates money for the maintenance of military, naval, and air establishments. Laws for the government of the armed forces, the well-known Articles of War and Articles for the Government of the Navy, are promulgated by Congress under constitutional authority.

The Constitution also provides that Congress is empowered "to declare war." While this clause is explicitly and summarily stated, does it mean that the armed forces of the nation may not be committed to nullify a threat to persons and property of the United States? Hostilities may be forced upon us by aggressive action of a foreign nation, as has been the usual case. Even in such cases, however, it is pointed out by Ogg and Ray in *Introduction to American Government*, that a declaration of war will be made by Congress "as a means ... of fixing, for the benefit of neutrals, an exact date from which the rights and liabilities incident to war are to be reckoned." According to William Whiting in his *War Powers Under the Constitution*, "The chief object of a declaration of war is to give notice thereof to neutrals, in order to fix their rights, and liabilities to the hostile powers ..." Thus, it appears that when a threat to our national welfare by armed force exists, no declaration of war by Congress is necessary to the commitment of our armed forces to destroy that threat. However, it is apparent that the ultimate authority governing the effectiveness of the armed forces lies in the Congress, possessing, as it does, the power to regulate the size of the military establishment and to appropriate the money necessary to its functioning.

**THE CENTRAL** figure in our national defense is the President, whose war power is derived chiefly from two clauses of the Constitution; first, "The executive power shall be vested in

a President of the United States of America," and second, "The President shall be commander-in-chief of the army and navy of the United States ..." Precisely what is entailed in these two functions, the Constitution does not say, and therein departs from its usual clarity. Neither Congress nor any court has fully defined the functions and responsibilities of the two titles, and national leaders throughout our history have held widely varying opinions for resolution of the ambiguity of this "no-man's land" of the Constitution.

In general, Congress provides money and men for the military establishment and the President uses them at his own discretion. As stated by Charles K. Burdick in *The Law of the American Constitution*, "The President as Commander-in-Chief of the Army and Navy has entire authority to provide for the disposition of military and naval forces of the United States, and to direct all military campaigns." In addition to inherent powers, the President possesses powers delegated by Congress. Although such delegations generally supplement the existing presidential power, persons who take the broad view of what is intended in the functions of executive and commander-in-chief may regard such delegations as not only superfluous but restrictive. For example, Newton D. Baker as Secretary of War observed that laws passed by Congress in 1917 "hampereed more than helped the prosecution of the World War." However interpreted, nevertheless, the power of the President as chief executive and commander-in-chief is supplemented, modified, and perhaps limited by congressional acts.

Although they are not exactly functions dealing with war, the presidential functions in the realm of foreign relations are so closely related thereto that consideration of those functions is inescapable. Authority for foreign relations functions is embodied in the constitutional statement, "He [the President] shall have power ... to make treaties ... and he shall nominate ... and shall appoint ambassadors, other public ministers, and consuls ..." By his handling of foreign relations a president can bring this nation to the brink of war and actually make hostilities, and a congressional declaration of war, inevitable.

To quote at length from Ogg and Ray's previously mentioned work, "As commander-in-chief, President Polk, in 1846, ordered American troops to advance into territory then in dispute with Mexico. The Mexican authorities had made it plain that they would consider such a step an act of war, and the soldiers were promptly fired upon. Polk thereupon said that war existed by act of Mexico, and Congress proceeded to a formal declaration. President McKinley ordered the battleship *Maine* to Havana harbor in 1898, notwithstanding that the Spaniards were certain to regard the act as unfriendly. The vessel was blown up, and the Spanish-American War followed. There will always be difference of opinion as to whether we were not at war with Mexico on the occasion of Admiral Mayo's capture of Vera Cruz by order of President Wilson in 1913, and with Russia when -- again on the President's sole authority -- American troops cooperated in military expeditions against the Bolsheviks via Archangel and Vladivostok in 1918. By his handling of relations with Berlin after the sinking of the *Lusitania* in 1915, President Wilson created a situation in which the only alternative to a declaration of war upon Germany would have been national stultification. And, more recently, the whole course of policy and action which over a period of years led the United States straight to involvement in the second World War ... was projected and carried forward under sole ultimate responsibility of President Franklin D. Roosevelt."

**NO STUDY** of any part of the Constitution is complete without a study of the interpretations of it, a method by which the Constitution grows and expands to accommodate changing conditions which would break a more rigid document. In this respect no president proved more resourceful in finding new sources of executive power nor in expanding and perfecting those already used than Abraham Lincoln.

With his inauguration on 4 March 1861, succeeding the indecisive and weak-willed Buchanan, Lincoln was confronted with the newly-born Confederate States of America, a hostile Congress, and a divided public opinion in the states loyal to the national government. In spite of the dangers inherent in the situation President Lincoln called for volunteers,

increased the size of the Regular Army, proclaimed a blockade of the ports under the jurisdiction of the Confederate States, and had the Treasury pay several million dollars for war costs without authorization or sanction of Congress -- all prior to the convening of a special session of Congress on 4 July 1861. In taking these actions, says G. F. Milton, Lincoln interpreted the power of chief executive and commander-in-chief as being "broad, that of Congress, explicit and restricted." In his message of 4 July 1861 to the special Congress which he had convened Lincoln declared, "The Executive found the duty of employing the war power in defense of the government forced upon him. He could but perform his duty or surrender the existence of the Government." Congress validated Lincoln's actions by passing legislation further implementing his decisions, and, in 1863, the Supreme Court by its decision in the so-called Prize Cases approved his use of war powers without the sanction of Congress in blockading the Southern ports. Hence, the precedent of the Lincoln administration would appear to be, according to Whiting, "that when war is commenced against this country by aliens or by citizens, no declaration of war by the government is necessary. The fact that war is levied against the United States, makes it the duty of the President to call out the army or navy to subdue the enemy, whether foreign or domestic."

A significant interpretation of constitutional powers appeared in our national government in the period immediately following President Lincoln's death. Due to the absence from Congress of representatives from the Southern states, the so-called Radical party took command of Congress in December 1865. Its leader in the House of Representatives, Thaddeus Stevens, emphatically declared the President's status to be subservient to that of the Congress. He proclaimed, "that as Congress shall order he [the President] must obey. There is no escape from it. God forbid that he should have one title of power except what he derives through Congress and the Constitution." This concept of power, probably more than any other factor, caused the near impeachment of President Johnson.

Although no new concept of constitutional interpretation arose from the administration of President Woodrow Wilson during the period of World War I a new and very successful method of exercising existing powers was evolved. Ample evidence exists that Wilson to a large extent shared Lincoln's views of presidential power under the Constitution. His actions in the capture of Vera Cruz, relations with the revolutionary Bolshevik regime, and in the conduct of relations with Germany have previously been described. In domestic affairs bearing on the national war effort President Wilson operated on the principle that necessity required action without prior congressional approval. He, like Lincoln, believed that the major factor in efficient government during time of war was centralization of power, authority and responsibility in the hands of the executive. However, in addition to being the chief executive, Wilson was also chief of the political party having a majority in Congress, and leader of public opinion. With these two powerful implements he was able to obtain any legislation he required. Milton says that "... Wilson went out of his way to keep Congress informed and to reveal his thinking to it. On many occasions, despite his possession of the power to do certain things, he would appear before the lawmakers to acquaint them with the situation, and to unburden his thoughts." It was the disintegration of this relationship at a crucial time that caused the defeat at home in 1919 of Wilson's program for a world organization.

One important challenge to the use of presidential power arose during the Wilson period. It involved the President's authority to send troops overseas before an invasion of this nation by an enemy. In the Selective Draft Law Cases, 245 U.S. 366 (1918), the Supreme Court made it clear that the commander-in-chief may dispatch forces to any part of the world in which he considers their services may be required.

**T**HE YEARS during which Franklin D. Roosevelt occupied the presidency saw no major change in constitutional interpretation regarding authority to commit the armed forces. However, the growth and use of the executive power during those years reached unprecedented levels. Like Wilson, Roosevelt

had the benefit of tight control of the political party possessing a majority in the houses of Congress and, consequently, there was no need to examine the terms of the Constitution for power to fit a need. In addition to a large residue of emergency powers delegated to the President by Congress in World War I and never taken away, numerous additional powers were conferred by Congress. The Trade Agreement Act in 1934 gave the President broad additional power in the foreign relations field. The Selective Training and Service Act of 1940 and the Lend Lease Act of 1941 were drastic delegations of power in furtherance of the defense effort. With the commencement of actual hostilities in 1941, the first and second War Powers acts gave President Roosevelt almost dictatorial powers with which to prosecute World War II. Among the revolutionary actions to which congressional acts contributed were the destroyer-bases exchange made with Great Britain by executive agreement, the delivery of tremendous quantities of war material to the Allies under the Lend Lease Act in navy convoyed American owned ships, and the delivery of a virtual ultimatum to the Japanese government.

Thus, the history of our national government is one in which the power of the executive has gradually grown and expanded, reaching its peak in the administration of Franklin D. Roosevelt, even though the basic document, the Constitution, upon which that government rests has been changed in no respect relative to the executive power. That growth of executive power has come about by usage of specific powers as exemplified by Lincoln, by congressional legislation such as the Lend Lease Act and War Powers acts, and by judicial decision in such cases as the Prize Cases of 1863 and the Selective Draft Law Cases of 1918. Although historians have made lists of presidents contributing most to the development of executive power, those lists are important to this appraisal only in that the presidents listed are those who were faced with a national crisis. It is true that congressional leaders have been successful in leading counter movements when the crisis was passed, but the precedents exist to aid succeeding chief executives to meet external crises.

WORLD WAR II has been the most destructive war in which this country or the world has engaged, most destructive in terms of armed forces involved, in cost, and in casualties. Because of its destructiveness and because it is the most recent war, it is necessary to consider briefly the effect of the Constitution on the actions of our national government immediately prior to declaration of this war.

The abject failure of the League of Nations to maintain the peace of the world is still too vivid to warrant review, and with the seizure of Czechoslovakia by Nazi Germany in 1939, it became apparent to President Roosevelt, as it did to European democracies, that the policy of appeasing Germany would not give "peace for our time." With this realization the President attempted to obtain congressional modification of the 1935 Neutrality Act, with its arms embargo, to permit necessary rearming by the democratic European countries. Isolationist sentiment in Congress was very gradually overcome and United States neutrality was modified in October 1939 by the "cash and carry" plan of selling arms to belligerents, and by the Lend Lease Act of March 1941. While obstructionists to the security policies of the President, who had secured the blessing of public opinion, were being overcome, the armed forces of our allies were driven out of the European peninsula. Great Britain the sole surviving ally in the European war was precariously near defeat. That a part of Congress had an isolationist attitude is evidenced by its disregard of Hitler's 1940 statements to the effect that two worlds were opposed and no reconciliation with the democratic world was possible. In fact, Senator Borah challenged the authenticity of reports available to the Secretary of State in 1939 when he told the President, "I have my own private sources of information, which I consider just as reliable as those of Secretary Hull." The cost in money and lives to this nation of isolationism can never be calculated. It can be considered fortunate for the security of this nation that the Japanese member of the Axis coalition administered, in December 1941, a tremendous blow to the United States at Pearl Harbor, effectively uniting the nation for World War II.

Turning to a consideration of present world conditions, it is quite apparent that the United States is at a cross-roads in its destiny; faced with the choice on one hand of leadership of democratic peoples to more certain security, and on the other with abandonment of that leadership and consignment of all of our ideals to oblivion. One thing is clear -- no future aggressor will fail to have learned the lesson of two world wars and attack potentially weaker democratic nations before attacking the United States. Our traditional allies have emerged from World War II in only slightly better condition than the defeated Axis powers. France and China are so preoccupied with internal strife that their position in the councils of the major powers is maintained more by courtesy than by actual power. The British Empire is in such distressing economic circumstances as to require partial dissolution and abandonment of many of its foreign commitments. In the words of Lord Halifax, "the British Government ... is in the most distasteful position ... in which its responsibility is greater than its power."

**I**N CONTRAST to the deplorable condition of our traditional allies, we are confronted with resurgent and aggressive nations. The doctrine of Marx and Lenin, on which the totalitarian government of the Soviet Union is based, inalterably commits its adherents to a struggle for survival with democratic nations. That there is no abatement of revolutionary fervor in present day Communist leaders is attested by Stalin's statements as recently as 9 February 1946, wherein he indicated Russian preparation for the inevitable wars to be expected as long as capitalism exists in the world.

As a result of World War II modern weapons have reached a state of development incomprehensible only a few years ago, a state of development which places the United States in a position comparable to that of the British Isles in 1940. Of the many advances in military technology the most appalling by far is the atomic bomb, a weapon whose destructiveness is variously estimated as being two to five hundred times that of an equal weight of ordinary explosives.

Bernard Brodie has said that, "... One of the most frightening things about the bomb is that it makes the destruction of enemy cities an immeasurably cheaper process than it was before, cheaper not alone in terms of missiles but also in terms of the air forces necessary to do the job." Fortunately, the United States is at present the only nation in the world capable of manufacturing atomic weapons, but many authorities whose estimates must be considered reliable predict the ability of other countries to duplicate the feat in three to ten years. As yet no defense against the bomb itself is in sight. The nuclear scientists, to quote Bernard Brodie again, are "much less sanguine than many laymen or military officers of their capacity to provide the instrument which will rob the bomb of its terrors."

Also, fortunately for the United States, other countries lack a comparable development and experience in strategic air operations. However, the conclusive demonstration by the United States and Great Britain in World War II of the effectiveness of strategic Air Power has not gone unnoticed.

The hope of the world for maintenance of the peace rests with the United Nations Organization. Whether that hope is misplaced or not is debatable. That international relations cannot be stabilized without unanimity among the major powers is recognized by the "veto power" of the major nations. All real progress toward international regulations has been blocked by the Russian use of the veto power. As James Burnham says, "There is no sentiment toward surrender of sovereignty on the part of any U.N. member," and without the surrender of a measure of sovereignty by member nations, no organization can be effective. As a former employee of the League of Nations so aptly phrased it, "One gets that old League feeling," when considering the future of the U.N.O.

**T**O GUARANTEE the security of the United States in terms of its vastly changed status in the world as a result of World War II, no drastic changes in the organizational structure of our national government are necessary, but rather an appreciation of the position of military policy in our overall foreign policy. Due to an inherent distrust of all things military, and to the heretofore adequate ocean barriers

around this continent, the American people have always regarded the armed forces as an evil to be tolerated only to prevent an invasion of this country. Their moral obligation to the peace loving people of the world has been discharged by giving all aid short of war. Only when American property was attacked was armed force used to further national interest. Heretofore that policy has been adequate. Now, however, our ocean barriers are ineffective and this nation finds itself not only the backbone but also the vanguard of democratic nations in any future war. In such a position President Truman has stated that, "... our foreign policy should take into account our military capabilities and the strategic power of our armed forces." In the future, when economic and diplomatic measures fail to enforce national policy, our national government through its chief executive must be prepared to use the armed forces if national survival is at stake. Normally, the mere threat of armed force will be sufficient to attain our objectives, but never again must military policy be considered separate from foreign policy.

**T**O ADMINISTER the enlarged concept of foreign policy, the President requires an advisory council, such as the National Security Council provided by the National Defense Act of 1947, to integrate military policy and foreign policy as well as the governmental agencies which exercise some control over those policies. Our history has indicated the frustration and confusion resulting from friction between the President and Congress. Therefore, it appears highly desirable that such an advisory council include not only the Secretaries of State, Army, Navy, and Air Force, but also the chairmen of the Senate Foreign Relations Committee and House of Representatives Foreign Affairs Committee. The chairmen of these two committees are invariably leaders of the majority political party in Congress, and including them in the council would normally unify governmental action toward meeting any emergency. However, the onus of decision must remain with the President who, like Lincoln, must perform his duty as Chief Executive or literally surrender the existence of the government.

There have been numerous instances in which the President and the majority of Congress belonged to rival political parties and it may be argued that the inclusion of congressional leaders in the National Security Council would prevent effective functioning. However, consideration of political platforms and presidential appointees during the past decade will reveal a wholesome unanimity of political parties in the foreign relations field, if in no other. Such bipartisanship has been indicated in the appointments of Republican Mr. Henry L. Stimson and Mr. Frank Knox as Secretaries of War and Navy respectively, by Democratic President Roosevelt in 1940. It was again evidenced by President Roosevelt's and later President Truman's delegation of Republican Senators Vandenburg and Connally as advisers to Secretary of State Byrnes at the several councils of Foreign Ministers. Such realization of the national character, in contrast to partisan politics, of foreign relations and military preparedness indicates the likelihood of constructive cooperation in such a council.

In order to perform its advisory function, the council must have available the resources of the combined intelligence sections of the Army, Navy, Air Force, and State Department. Such a combined agency now exists in the Central Intelligence Agency. The function of this agency and its relation to the council is indicated by President Truman's statement, "Using the advice of our scientists and our intelligence officers, we must make the wisest estimate as to the probable nature of any future attack upon us, determine accordingly how to organize and deploy our military forces, and allocate the available manpower, material, and financial resources in a manner consistent with the overall plan."

With the advice of the National Security Council, or what is unlikely, in spite of its advice, the President must be prepared to take whatever action is necessary to preserve national security. If commitment of the nation's armed forces in an offensive-defensive effort is required, he must be prepared to accept the responsibility for issuing the order. In no other way can the security of this nation be maintained in this age of advanced military technology. The basis for

such authority exists in constitutional law as evolved by usage of presidential decision. If American public opinion keeps pace with changing world conditions -- and therein lies a problem beyond the scope of this study -- a necessary presidential decision to invoke his war powers would probably receive acceptance by the realistic and courageous American public. The people of this nation expect courageous presidential leadership whenever national peril may arise and in the past have supported that leadership.

In summary, it is submitted that constitutional law does permit presidential use of armed force defensively, when national survival is endangered, without prior approval of Congress; and that the executive advisory council to integrate national foreign and military policy is necessary to permit the Chief Executive of the United States to meet the requirements of national security.



*When one speaks of Air Power, one implies, where great nations are concerned, a certain but undefinable standard of first line strength and, behind that, both the immediate and stored reserves which can be used to replace losses, and - which is as important - the manufacturing capacity and resources which can make good the gaps in the reserves and even increase the output in war. Reserves of personnel and adequate means for the training of human replacements are no less essential. Without such a solid background there can be no reality in Air Power. It becomes merely a facade which must crumble in war; as the sea power did which France sought to create for the War of the League of Augsburg at the end of the seventeenth century.*

-- J. M. Spaight,  
*Air Power in the Next War (1938)*

# EDITORIAL

BY MAJ. GEN. MUIR S. FAIRCHILD

**T**HE UNITED STATES faces a state of insecurity in the future unparalleled in our history. This grows out of the simultaneous existence of two basic factors. First, the juxtaposition in the world of the future of our great slow moving democracy, dependent for decision on the slow crystalization of majority opinion, side by side with powerful secret dictatorships, potentially capable of rapid aggressive action with little or no warning. The second basic factor is the tremendous recent advances of technology, making quite possible the delivery, relatively instantaneously, over vast distances, of powerful blows of such destructiveness as to be potentially decisive. Times have changed -- and very much for the worse for us!

Time was, when we could count with certainty upon a warning period measured in many months, at the very least, before any real danger could possibly be brought against us. Isolated, safe and secure behind our great ocean barriers, we could have watched the slow, laborious build-up of the great amphibious force and its enormous logistic train which alone could have constituted a real threat. We should have been able to mobilize and train, to defend against one of the most difficult and perilous of military operations -- an ocean crossing with a landing and build-up on a hostile shore in the face of determined opposition. With such security, no wonder we have developed into one of the least military minded nations in the world.

But what a change is here! We ourselves have demonstrated, and are demonstrating, that it is technologically possible to create enormous strategic Air Power to which those erstwhile ocean barriers are nonexistent. Logic tells us that such Air Power, once created, trained and armed by any potential aggressor nation, can be launched without warning, literally in the matter of moments, on signal from some deeply secret conference room. We may well wonder what our radar operators, weary from long months of unrewarded vigil, might make of those blips suddenly appearing on their scopes. We may speculate as to the reaction of our fighter controllers and higher headquarters to the first warning flash.

And it must be noted that this would not necessarily be only the opening blow in the traditional strategic air campaign of the last war. *This mission might be the campaign.* The pay load might be the atomic bomb stock pile accumulated

over years of production. It might include mutant disease bacteria, of types previously unknown, produced in great quantity at little cost and effort.

The experts say, three atomic bombs would completely destroy Washington. Without that intricate complex center, who would plan, direct, coordinate to bring order out of the ensuing chaos, to defend what was left to us, and to smash through to victory over our untouched, alert enemy?

This is not a pretty picture. It is grim indeed. Yet it is realistic. It *could* happen here. We Americans, by and large, do not like stories with unhappy endings. We like the fairy story type:-- "and so they lived happily ever after!" But this is one time, we Americans, all of us, must face up to reality no matter how unpleasant the picture. It may be the price of survival.

There is no reason to suppose that providence has singled out the United States for completely different treatment from that she has accorded to the long procession of predecessor nations. From long before Babylon and Ur of the Chaldees the pattern has invariably been the same. A young, vigorous nation rises to the heights of power and prosperity. But once so risen, a strange softening process sets in to sap that vigor and vitality which alone made the rise possible. That process is marked by an increase of greed and selfishness among men, by concern for self interest above the common welfare, by unwillingness to sacrifice and to serve, and by lack of sense of individual responsibility to act for the good of the nation as a whole.

When that process has advanced to a point, in sweep the lusty barbarians from the outlands and a once great power becomes but another name in history. And it should be carefully noted that no nation has yet retraced that upward path. Where today is the might that was Babylon, the magnificence that was Egypt, the glory that was Greece, the power that was Rome?

If we would indefinitely postpone the addition of the name of our nation to that endless list, there are certain things we must do. I leave to our leaders in the political, the moral, the educational and the economic fields, pronouncements on those several vital matters on which vigorous forward-looking action surely must be taken if our nation is to remain strong and healthy for survival. I content myself with one pronouncement from our own field of activity, the obvious and compelling truth of which is not open to question. Unless we maintain clearly adequate Air Power in being, no matter at what sacrifice of goods and treasure, all else may well be futile.

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# AIR ANTHOLOGY

## THE TOOL

AND NOW, having spoken of the men born of the pilot's craft, I shall say something about the tool with which they work--the airplane. Have you looked at a modern airplane? Have you followed from year to year the evolution of its lines? Have you ever thought, not only about the airplane but about whatever man builds, that all of man's industrial efforts, all his computations and calculations, all the nights spent over working draughts and blueprints, invariably culminate in the production of a thing whose sole and guiding principle is the ultimate principle of simplicity?

It is as if there were a natural law which ordained that to achieve this end, to refine the curve of a piece of furniture, or a ship's keel, or the fuselage of an airplane, until gradually it partakes of the elementary purity of the curve of a human breast or shoulder, there must be the experimentation of several generations of craftsmen. In anything at all, perfection is finally attained not when there is no longer anything to add, but when there is no longer anything to take away, when a body has been stripped down to its nakedness.

It results from this that perfection of invention touches hands with absence of invention, as if that line which the human eye will follow with effortless delight were a line that had not been invented but simply discovered, had in the beginning been hidden by nature and in the end been found by the engineer. There is an ancient myth about the image asleep in the block of marble until it is carefully disengaged by the sculptor. The sculptor must himself feel that he is not so much inventing or shaping the curve of breast or shoulder as delivering the image from its prison.

In this spirit do engineers, physicists concerned with thermodynamics, and the swarm of preoccupied draughtsmen

tackle their work. In appearance, but only in appearance, they seem to be polishing surfaces and refining away angles, easing this joint or stabilizing that wing, rendering these parts invisible, so that in the end there is no longer a wing hooked to a framework but a form flawless in its perfection, completely disengaged from its matrix, a sort of spontaneous whole, its parts mysteriously fused together and resembling in their unity a poem.

Meanwhile, startling as it is that all visible evidence of invention should have been refined out of this instrument and that there should be delivered to us an object as natural as a pebble polished by the waves, it is equally wonderful that he who uses this instrument should be able to forget that it is a machine.

There was a time when a flyer sat at the centre of a complicated works. Flight set us factory problems. The indicators that oscillated on the instrument panel warned us of a thousand dangers. But in the machine of today we forget that motors are whirring: the motor, finally, has come to fulfil its function, which is to whirr as a heart beats--and we give no thought to the beating of our heart. Thus, precisely because it is perfect the machine disassembles its own existence instead of forcing itself upon our notice.

And thus, also, the realities of nature resume their pride of place. It is not with metal that the pilot is in contact. Contrary to the vulgar illusion, it is thanks to the metal, and by virtue of it, that the pilot rediscovers nature. As I have already said, the machine does not isolate man from the great problems of nature but plunges him more deeply into them.

Numerous, nevertheless, are the moralists who have attacked the machine as the source of all the ills we bear, who, creating a fictitious dichotomy, have denounced the mechanical civilization as the enemy of the spiritual civilization.

If what they think were really so, then indeed we should have to despair of man, for it would be futile to struggle against this new advancing chaos. The machine is certainly as irresistible in its advance as those virgin forests that encroach upon equatorial domains. A congeries of motives

prevents us from blowing up our spinning mills and reviving the distaff. Gandhi had a try at this sort of revolution: he was as simple-minded as a child trying to empty the sea on to the sand with the aid of a tea-cup.

It is hard for me to understand the language of these pseudo-dreamers. What is it makes them think that the plough-share torn from the bowels of the earth by perforating machines, forged, tempered, and sharpened in the roar of modern industry, is nearer to man than any other tool of steel? By what sign do they recognize the inhumanity of the machine?

Have they ever really asked themselves this question? The central struggle of men has ever been to understand one another, to join together for the common weal. And it is this very thing that the machine helps them to do! It begins by annihilating time and space.

To me, in France, a friend speaks from America. The energy that brings me his voice is born of dammed-up waters a thousand miles from where he sits. The energy I burn up in listening to him is dispensed in the same instant by a lake formed in the River Yser which, four thousand miles from him and five hundred from me, melts like snow in the action of the turbines. Transport of the mails, transport of the human voice, transport of flickering pictures--in this century as in others our highest accomplishments still have the single aim of bringing men together. Do our dreamers hold that the invention of writing, of printing, of the sailing ship, degraded the human spirit?

It seems to me that those who complain of man's progress confuse ends with means. True, that man who struggles in the unique hope of material gain will harvest nothing worth while. But how can anyone conceive that the machine is an end? It is a tool. As much a tool as is the plough. The microscope is a tool. What disservice do we do the life of the spirit when we analyze the universe through a tool created by the science of optics, or seek to bring together those who love one another and are parted in space?

"Agreed!" my dreamers will say, "but explain to us why it is that a decline in human values has accompanied the rise of the machine?" Oh, I miss the village with its crafts

and its folksongs as much as they do! The town fed by Hollywood seems to me, too, impoverished despite its electric street lamps. I quite agree that men lose their creative instincts when they are fed thus without raising a hand. And I can see that it is tempting to accuse industry of this evil.

But we lack perspective for the judgment of transformations that go so deep. What are the hundred years of the history of the machine compared with the two hundred thousand years of the history of man? It was only yesterday that we began to pitch our camp in this country of laboratories and power stations, that we took possession of this new, this still unfinished, house we live in. Everything round us is new and different--our concerns, our working habits, our relations with one another.

Our very psychology has been shaken to its foundations, to its most secret recesses. Our notions of separation, absence, distance, return, are reflections of a new set of realities, though the words themselves remain unchanged. To grasp the meaning of the world of today we use a language created to express the world of yesterday. The life of the past seems to us nearer our true natures, but only for the reason that it is nearer our language.

Every step on the road of progress takes us farther from habits which, as the life of man goes, we had only recently begun to acquire. We are in truth emigrants who have not yet founded our homeland. We Europeans have become again young peoples, without tradition or language of our own. We shall have to age somewhat before we are able to write the folksongs of a new epoch.

Young barbarians still marveling at our new toys--that is what we are. Why else should we race our planes, give prizes to those who fly highest, or fastest? We take no heed to ask ourselves why we race: the race itself is more important than the object.

And this holds true of other things than flying. For the colonial soldier who founds an empire, the meaning of life is conquest. He despises the colonist. But was not the very aim of his conquest the settling of this same colonist?

In the enthusiasm of our rapid mechanical conquests we have overlooked some things. We have perhaps driven men into the service of the machine, instead of building machinery for the service of man. But could anything be more natural? So long as we were engaged in conquest, our spirit was the spirit of conquerors. The time has now come when we must be colonists, must make this house habitable which is still without character.

Little by little the machine will become part of humanity. Read the history of the railways in France, and doubtless elsewhere too: they had all the trouble in the world to tame the people of our villages. The locomotive was an iron monster. Time had to pass before men forgot what it was made of. Mysteriously, life began to run through it, and now it is wrinkled and old. What is it today for the villager except a humble friend who calls every evening at six?

Every machine will gradually take on this patina and lose its identity in its function.

Air and water, and not machinery, are the concern of the hydroplane pilot about to take off. The motors are running free and the plane is already ploughing the surface of the sea. Under the dizzying whirl of the scythelike propellers, clusters of silvery water bloom and drown the flotation gear. The element smacks the sides of the hull with a sound like a gong, and the pilot can sense this tumult in the quivering of his body. He feels the ship charging itself with power as from second to second it picks up speed. He feels the development, in these fifteen tons of matter, of a maturity that is about to make flight possible. He closes his hands over the controls, and little by little in his bare palms he receives the gift of this power. The metal organs of the controls, progressively as this gift is made him, become the messengers of the power in his hands. And when his power is ripe, then, in a gesture gentler than the culling of a flower, the pilot severs the ship from the water and establishes it in the air.

--Antoine de Saint Exupéry, *Wind, Sand and Stars*, Reynal & Hitchcock, N. Y., (1939)

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# FOREIGN HORIZONS

## THE TREND OF FUTURE WARFARE

By

Lieut.-General Sir Giffard Martel, K.C.B., K.B.E., D.S.O., M.C.

*From the Journal Royal United Service Institution, August 1947.*

THERE is general agreement that the invention of the latest forms of warfare such as the use of atomic bombs or of germ warfare will radically change the whole aspect of Imperial Defence. There are those who argue that they have heard these tales before, and they point to the fact that gas warfare or the use of great armoured forces did not materially change the principles of the defence of our Empire. It must, however, be remembered that there was always some degree of defence against gas, and that complete victory could not be gained at one stroke by its use. The same applied to the use of armoured forces. With the latest weapons, however, such as atomic bombs, it will be perfectly possible for one nation to destroy another nation completely in a few hours.

It is possible that every single person hopes that no nation will ever employ these terrible forms of warfare. It seems likely however that nations may well have to equip themselves with these new weapons so as to have the means to carry out the threat of reprisals and thus secure protection against this form of attack. We must therefore endeavour to deduce the kind of warfare that is likely to be used when these weapons are available. Atomic bombs and germ warfare can be carried out by the use of aeroplanes or by using rockets. It seems likely that rockets will be used in most cases. Every nation will have a number of rocket stations. At each station there will be a deep underground cavern containing the apparatus and the bombs. The rockets will be propelled up through a narrow channel into the air. The direction in which they are launched will be immaterial, for

once they reach the air they will be directed by radar or other means on to the enemy industrial areas and main centres of habitation. It will be possible to launch a thousand of these bombs and thus destroy the greater part of the enemy nation. The rocket stations being deep underground will be almost invulnerable, so that if the enemy launches his rockets first his country can still be destroyed by the bombs possessed by the other nation.

It is difficult to believe that any civilized nation will initiate such a frightful form of warfare, but on the other hand there is every indication that nations will develop these weapons as a precaution while so little headway is being made by any international conferences to establish peace and security.

But, although no large scale attack with these new weapons may ever be launched, there is another form of warfare that is already in use to-day. This is the use of troops for infiltration purposes and propaganda against a potential enemy. It is obvious to the whole World that Russia has been using this form of warfare in the so-called peace period since the termination of the late war. The process is a simple one. Russia wants, we will say, some oil concessions from a neighbouring country. Russian troops therefore infiltrate in the country. Sometimes this is done openly. At other times the troops form cells in the forces of that country. They soon obtain a stranglehold over the people. Voting is closely controlled and a secret ballot is quite out of the question. In this way the part of the country that has been "invaded" becomes detached from control by their own people or the whole country may even become a puppet State under complete Russian control. All this is done entirely against the will of the people concerned, but they may well lack the necessary strength or determination to oppose such action.

The counter to these infiltration and propaganda tactics is quite simple. If the British Empire wishes to ensure that a nation which borders on the Russian Empire shall retain the independence to which it is entitled, we must possess sufficient strength in light mobile forces of all three Services. If, at the request of the country concerned,

soldiers are sent up to the area which is affected, the situation can usually be restored. The people were not prepared to stand alone against the Russian infiltration but, as soon as British troops arrive, they rally to the cause and the Russian tactics are nullified. There have been several instances in which the arrival of British troops has enabled a country or a part of a country to retain its independence in this way. Unfortunately we have not possessed anything like sufficient strength in these simple types of forces to meet our commitments all over the World. This is a form of military policing which has long been one of the main duties of all three Services in the British Empire.

It may be argued that such action is merely the prelude to war. It must, however, be remembered that a nation, such as Russia, may well be prepared to gain her objects by methods of infiltration, but would certainly not be prepared to go to war to attain her ends. Russia has at present great internal problems and would certainly not be prepared to launch into another great war, quite apart from the fact that she is well behind in the development of modern weapons such as those making use of atomic energy.

**I**T IS, therefore, clear that there are two definite and distinct roles which our forces must be prepared to fill. First comes the development and possession of the means of launching atom bombs or germ warfare from underground stations or to the industrial areas and centres of habitation of an enemy country. This will only require small numbers of men but they will have to be long-service. There will be no question of mobilizing such forces from the reservists. They will have to be mobilized and ready at all times, and this will present no difficulty because they will be so few in numbers. Secondly, we must have the police forces which we have always needed to meet our many commitments all over the World. These must be in considerable strength. It is bodies that count more than atom bombs for the purpose of stopping infiltration tactics. Also the troops must be first class men and highly trained. Here again there is no question of mobilization to meet a situation. The men must be there at all times or available at short notice to stop such tactics

It will be asserted by many people that there is a third role for our fighting forces, and that it might well have been placed first and not last. This is to provide the nucleus of a military force of the type which would be used if a great war arose at the present time and before anyone is ready to wage atomic warfare. The Army would have to include all the heavy weapons, such as guns and heavy tanks and the inevitably large maintenance units which they require, also all the training establishments for this type of warfare and the schools and colleges for instructional purposes. A large reserve of trained men is essential for this type of war for mobilization, hence the Services have to use a large proportion of short-service men and conscripts to produce this reserve. This short service means that very large training establishments must be maintained to train relays of men, compared to the small task of training men when they remain for, say, 21 years with the Colours. We therefore see at once that the maintenance of the nucleus of a present-day large manpower military force is a formidable affair using up a large amount of man-power and financial cost.

What course have we so far taken over this vital and intricate matter? We have accepted a compromise. We are attempting to maintain this nucleus, but our plans for the rapid mobilization of military forces of the present-day type are handicapped at every turn by lack of manpower and finance. For the same reason our military forces abroad are far below what is needed to carry out the duties to meet our commitments in connection with military policing in various parts of our Empire. If we concentrated on the latter role we could have first class troops ready to carry out these duties and stop infiltration tactics and retreating from so many parts of our Empire. Of course the ideal would be to have these troops which are needed in considerable strength and, in addition, to have the nucleus of present-day forces on which to mobilize for a present-day great war. This would mean a great increase in our demands on manpower and finance and would be ruled out at once. Are we wise, therefore, in accepting a compromise over this matter or should we take a

risk and drop the nucleus for great war forces and concentrate on those vital police forces?

What risk would this entail. Is there any real risk of another great war in the next five to ten years? It is difficult to see how such a war would come about. It is perfectly possible to reason that at some later stage tension will arise and that the risk of a great war will return. But surely no one will at that stage start to mobilize a whole nation and raise huge forces including hundreds of divisions in the army when the new weapons using atomic energy are there at hand. There are those who argue that "normal" forces will be needed at that stage in addition to atomic forces. They point out, for instance, that they will be needed to seize some territory on which to establish rocket bases, etc. It seems more likely, however, that by that time distances will be of little importance. The importance of distance is diminishing rapidly every day. It is difficult to see how normal forces will be of the slightest use when one or both sides start launching atomic bombs or germ warfare. Progress is advancing at an ever increasing rate; few people realize the present-day speed. It would now be suicidal to look backwards.

On the other hand the risk in not maintaining suitable police forces for the every day defence of many parts of our Empire is very real. What a sigh of relief would arise from all our commanders overseas if they heard that they were to be provided with considerable forces of long-service and highly trained men. The forces would have to be very mobile and of a light and simple nature. The Army would use light armour and mobility more than heavy guns.

**WE** HAVE now come to the parting of the ways. Are we to try and continue to maintain a nucleus of the last war type of army and at the same time try to improve matters so that our commanders abroad may have better police forces to deal with their many commitments, or should we definitely accept the risk that we will be unprepared to raise a large manpower army of the last war type during the next few years in exchange for the ability of having a really good army abroad to carry out these police duties? The latter course would

mean that we would drop conscription and turn to higher pay and more amenities to attract volunteers. Many people take the view that the present time is not the moment for taking such steps in dealing with our manpower problems. At the same time it is well to examine the facts as they stand to-day.

Conscription is entirely foreign to our feelings and tradition and is only needed to enable us to mobilize a large manpower army in the event of another great war. But now the point will be raised that we shall not be able to obtain the volunteers for the long-service regular forces to carry out the police duties. Of course, we would have to pay them far more highly. It is probable that the same regulars could be used to man the rocket stations at home, thereby providing some degree of home service, but we would, of course, have to build far more married quarters for those on foreign stations. The saving effected in training establishments by using long-service men is, however, so great that these expenses and a high rate of pay could certainly be met. A further saving would be effected by the increased efficiency of long-service men. If an officer is given a duty and asked if he will have five long-service men or ten conscripts to carry out the task he will certainly choose the former. This will result in a considerable saving in manpower.

The spirit of adventure is still very much alive in this Country. When men found that they could lead an interesting and exciting life abroad and have a well paid career for their life-time, a pension when they left the Services, and married quarters for their families, they would certainly join up as volunteers.

Although it may be considered inadvisable to do so for various reasons, it would therefore appear to be definitely possible to raise a very fine long-service army from voluntary enlistment to carry out our police duties abroad, and in the future the same personnel might well man the new types of weapons of war at home and abroad which are bound to materialize in the next few years and for which no large manpower army will be needed.

BEFORE going any further, however, it would be well to see to what extent these proposals are affected by the two main principles that have always been accepted for our Imperial Defence.

The first principle is that each part of our Empire must be responsible for its own local defence. It must, however, be remembered that the minimum possible force must be used for local defence so as to leave the maximum forces available for concentration at vital points to carry out the main plan. Local security in each part of the Empire can therefore only be assured for a limited time, and additional troops may have to be sent to a threatened point as a reinforcement or for relief.

The second principle is that our main air and maritime communications must remain secure. This is the most important duty of the fighting Services. The whole existence of our Empire and the survival for more than a few months of this Country depends on these communications. Moreover, when we were considering the first principle it became clear that the ultimate security of a portion of our Empire might depend on the arrival of reserves, and this in turn depends on these communications.

It seems clear that these two vital principles will be maintained more securely when we possess first class military forces abroad to secure our position and to stop enemy infiltration tactics. Reserves of these light forces situated at suitable centres such as the Middle East will naturally be needed to support local troops when the necessity arises. In the past such forces have been supplied mainly by Great Britain, but it is now clear that the Dominions will have to take a larger share in this work. It is, therefore, more essential than ever that all the forces in the Empire should be organized and trained on similar lines, so that they can co-operate, completely and easily on service.

Rocket stations of the type which were described earlier in this paper will no doubt be established in various parts of our Empire for use if the necessity should arise in a great war, but it seems likely that the police duties may play the most important part in our Imperial Defence in the future. It may be that these police duties will eventually

be taken over by some international body, but our security for a long time ahead will depend on the efficiency and strength of our own forces.

It is, therefore, for consideration whether we would not do better to depend on long-term regular personnel for all our fighting Services and whether this might not result in a saving of manpower and financial expenditure combined with an increase of security in Imperial Defence.

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### GERMAN REPORTS ON THE AIR WAR

From the *London Times*, 15 September 1947.

**F**URTHER glimpses of the confused scene at Hitler's headquarters in Berlin in the closing phase of the war are given in captured German documents now issued by the Air Ministry. The documents consist of reports to the Führer by Generals Rommel and von Kluge and by Speer, and the memoirs of General Koller, German Chief of Air Staff.

In a chronicle of events from April 14, 1945, up to a few days after Germany's collapse, Koller describes daily staff briefings which abounded in recriminations. On April 14, Hitler declared in exasperation: "The *Luftwaffe* are a lazy bunch--nobody does any work--with red tape everywhere." A week later he is reported as saying in great excitement: "The entire *Luftwaffe* Command should be hanged immediately." Koller comments: "The continual coarse insults make me extremely bitter. I can't remedy in a few months the many mistakes both in armament and administration made many years ago. The Führer himself, moreover, made some of the greatest mistakes."

Koller considers the reasons why Germany lost the war, and concludes that the loss of air supremacy was decisive. The political leadership in Germany, in its short-sightedness and in complete misjudgment of the tenacity and mentality of the Anglo-Saxons and the potential war power of the United States, believed that the war in the west had already been won in 1940 and started out on the folly of the Russian war. "The calls of us outsiders and little general staff officers for aircraft and more aircraft and for new types were either

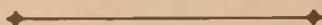
not heard or they were laughed off."

Koller sums up: "Everything depends on air supremacy; everything else must take second place. The supremacy of the sea is only an appendage of air supremacy. The country that has air supremacy and vigorously strengthens its air power over all other forms of armament to maintain its supremacy will rule the lands and the seas, will rule the world. The proper conclusions with respect to leadership and planning of armament must be drawn from this fact. A strong and independent air force command, put far above the others, or an air force command on equal footing with the command of the rest of the armed forces.

"The requirements for maintaining air supremacy are decisive in all questions of organization, relative strength, allotment of man-power and supplies. All plans for the defence of a country, a continent, or a sphere of interest, or for offensive operations, must be in the hands of the air force command. The army and navy commands are subordinate authorities. Although they cannot be done away with entirely, they must adapt themselves to all requirements in the air, which covers the entire world and extends to the high heavens."

Other documents released by the Air Ministry include a report from Rommel and von Kluge on the effect of carpet bombing in Normandy soon after D Day, and a statement by Speer to Hitler on the serious damage to the German economy which by the end of June, 1944, had resulted from allied attacks on synthetic oil plants.

It is stated that the total production for June of that year had been reduced to 53,000 tons of aviation spirit, against a consumption for May of 195,000 tons.



*In the last four years our conception of war, and with it of strategic intelligence, has included the technological, the sociological, the economic, and the political and other aspects of war as well as the more limited military aspect.*

— George S. Pettee  
*The Future of American Secret Intelligence,*  
(Infantry Journal 1946)

# Airman's Reading

Bomber Offensive, by Marshal of the RAF Sir Arthur Harris (Macmillan, \$2.75).

Reviewed by  
Colonel Dale O. Smith

THIS IS the most noteworthy book concerning pure strategic Air Power that has been written since the war. Sir Arthur Harris has long preached the gospel of waging war by bombing to destruction an enemy's war-making potential at the civilian level. The book is a story of his tireless and generally discouraging efforts to have this new concept of warfare adopted. His long struggle against the potent forces that blindly clung to the traditional methods of warfare, even when those traditional methods were hopelessly ineffective as in the days when Britain was fighting alone, has left him with a bitterness against those entrenched forces that is not concealed in the book. In fact there are some passages that read much like Houie's *Fight for Air Power*.

Sir Arthur Harris pulls no punches. He is brutally frank, even concerning himself. He explains his success in joining the Royal Flying Corps during World War I by saying: "I had an uncle on Kitchener's staff so I slid round the 6,000 'waiting list' --- it was sheer nepotism." Before that he had been a bugler in the First Rhodesian Regiment, and in a campaign against German West Africa he participated in the "greatest marching performance of an infantry brigade in British military history." After completing that campaign he sailed for England "determined to find some way of going to war in a sitting posture."

His assignment to the first Home Defence squadron of eight fighters to attack the Zeppelins that were bombing London brought about his conception of independent air operations. His belief was substantiated by General Smuts, then a member of the War Cabinet, who said, "As far as at present

can be foreseen there is absolutely no limit to the scale of its [Air Power] future independent war use." The author's first experiment with the use of strategic Air Power occurred in 1922 when a rebellion was raging in Iraq. Economy cuts forced the reduction of the British Army occupation forces and the military control of Iraq was transferred to the RAF "entirely in order to save money." The outstanding success of this revolutionary method of occupation might well be a lesson for us today, yet no one has given it serious thought. It was simplicity in itself: "When a tribe started open revolt we gave warning to all its most important villages ... that air action would be taken after 48 hours. Then, if the rebellion continued, we destroyed the villages and by air patrols kept the insurgents away from their homes for as long as necessary until they decided to give up, which they invariably did ... the casualties on both sides were infinitely less than they would have been in pitched battles on the ground..."

By far the major portion of the book deals with Bomber Command's operations against Germany during World War II. Veterans of the 8th Air Force will take exception to some of the author's claims and particularly to his unfavorable comparison of the 8th with Bomber Command. Yet, the boldness of these claims is to be expected from a man with such fierce convictions and intense loyalty to his own organization. He is unstinting in his praise of AAF leaders and fighting men, however, just as he is scathing in his criticism of unnamed incompetents in the British Army, Navy and Civil Service.

**T**HIS BOOK will be an eye-opener to those members of the United States Air Force who think that now, when our co-equal status with the Army and Navy is provided by law, our conflicts with those two very senior services will be over. Independence of the RAF, as clearly shown by Sir Arthur Harris, was more of a dream than a reality even up to and including the war years. The dominance of the other two services, steeped in tradition and potent with prestige and political influence, kept the RAF stripped to the bone in all forms of aviation except those which directly supported the Army and the Navy. It was a heartbreaking uphill climb

all the way which finally achieved for the RAF in next to the last year of the war a force which Harris believed was barely adequate to win the war by bombing alone. It was a force one quarter of the size he had recommended at the beginning of the war. No one in the USAF who has witnessed the recent opposition to Unification should believe that the battle for Air Power has been won, and Marshal of the RAF Harris has given us an outline of things to come.

*Bomber Offensive* covers in great detail the evolution of RAF night bombing tactics and the pathfinder technique of locating and marking targets. Since this is a phase of bombing not too well known in the USAF, the book has value as a tactical manual. The RAF was forced to undertake night bombing because of the ineffectiveness of the .303 calibre guns on their bombers. This inadequate armament sharply curtailed RAF employment and greatly reduced bombing accuracy until the pathfinder technique was developed. In this light it might be profitable for the USAF to re-evaluate its aircraft armament requirements.

Sir Arthur Harris stresses a concept of air bombing that differs somewhat from that generally expressed by members of the USAF. He believes that the destruction of "panacea targets" such as ball-bearing factories, synthetic oil plants, molybdenum mines, and other supposedly vital bottlenecks in the German war industry, never achieved a glimmer of the results predicted by the economic experts. Reports of the United States Strategic Bombing Survey generally bear him out on this belief. "...We were always told," he writes, "just when the enemy ought by rights to have been surrendering unconditionally, that some other manifestation in that particular war industry had just been discovered, or that there was some material or product which the enemy could use...as an alternative." Harris believes that strategic bombing should be conducted against industry as a whole which is concentrated in the major cities of a nation, and not against any particular target system. His logic behind this concept is sound, and he points out that the AAF eventually adopted this strategy in the B-29 area bombing of Japan. This theory is even more applicable to atomic bombing.

A fundamental conviction of Marshal of the RAF Harris is expressed in the last chapter: "It is an obvious and most certain conclusion that if we had had the force we used in 1944 a year earlier, and if we had then been allowed to use it together with the whole American bomber force, and without interruption, Germany would have been defeated outright by bombing as Japan was... We were only prevented from having that force by the fact the Allied war leaders did not have enough faith in strategic bombing. As a result, the two older services were able to employ a large part of the nation's war effort and industrial capacity in the production and use of their older weapons, and were also able, when the older weapons failed, to get what amounted to more than half our existing bomber force used for their purposes."

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America's Future in the Pacific, by John Carter Vincent and others (Rutgers Univ., \$3).

*Reviewed by*  
Hilton P. Goss

THIS VOLUME presents a baker's dozen of lectures delivered at the Second Quadrennial Institute, under the Mayling Soong Foundation, at Wellesley College in October 1946. The twelve persons who gave the lectures are well known to those who have followed the recent literature on the problems of the postwar Pacific. Naturally, in any such collection, uniform quality is absent. To this reviewer, the presentations of Raymond Kennedy on "American Interest in the Social and Political Future of The Pacific Peoples," of Felix M. Kessing on "American Island Territories in the Pacific," of Rupert Emerson on "American Policy toward Dependent Areas" and "Nationalist Movements in Southeast Asia," and of Vera Micheles Dean on "Russia as a Factor in the Security of the Pacific" seem to be more to the point and more penetrating than the others.

In a society which prefers to obtain its facts and have its opinions prepared for it by listening to an "expert" talk, such lectures as these often sound better than they

read. There is scarcely anything in any one of the chapters which a reasonably well-informed person does not already know or cannot deduce from ready observation. Still it is a help to have so many facts on problems of a controversial nature brought into focus by a series of speakers who know whereof they talk. This is not to infer that the book lacks value, even for the individual to whom the basic conflicts in the Pacific area are familiar matters. It is rather to suggest that it presents, despite the shortcomings of the lecture method, a concise review of the known data with a dozen different interpretations of the implications of these factors.

The deficiencies of past and present American policy are not glossed over. Several speakers make reference to Washington's acquiescence in or support of British, Dutch, and French postwar manifestations of imperialism. And evidences of American imperialism in the same period receive considerable mention. Likewise, the official policy of bypassing the opportunities to bolster the prestige and functioning of the United Nations trusteeship plans draws a good deal of criticism. However, more than one authority presents every legitimate example of American forthrightness and accomplishment in its best light. As a nation, the United States has much to its credit in its Pacific dealings. The pity, in the estimation of the more realistic speakers, is that many past opportunities to do better have been missed. And the danger, as most of them see it, is that, unless those in control of the occupation of Japan and Korea, of the administration of Guam, Samoa, and other territories, and of the relations with all the powers involved in the Pacific area do more to promote the realization of American ideals, the United States will lose its many advantages, especially in those regions where vigorous native populations are pressing for the rights of self-determination.

Although it is by no means in every chapter, the recurrent theme of the collection is a challenge to the United States to formulate, announce, and implement a policy for its conduct in the Pacific. That some of the inconsistencies displayed by the United States to date can be laid at the doors of the State, War, and Navy Departments, makes it all

the more desirable that this book be examined and digested by those who will form and execute the country's policies in the years to come. For, as one ex-servicewoman, Mildred McAfee Horton, President of Wellesley and former commandant of the WAVES, writes in her able introduction to the volume, in few of the regions of the world "has this nation a greater responsibility for making intelligent decisions than in the Pacific."

An interesting and perhaps unfortunate feature of the series is that, save for a passing reference, the claims of the Latin American nations, whose borders face the Pacific, to be considered in discussions affecting the future of the area, are ignored. The volume contains an admirable reading list to encourage further exploration into the subjects presented. The lack of an index somewhat weakens the usefulness of the collection.



Fundamentals of Naval Warfare, by Lee J. Levert (Macmillan, \$5).

Reviewed by  
Captain Willard J. Suits, USN

**A**LTHOUGH the author states that this book is intended for the general public, he has difficulty in confining himself to a fundamental treatment. He leads the reader through considerable of the theoretical, which is interspersed with nebulous conceptions of military strategy that he claims would have been most expedient if followed in World War II. Containing eleven sections and seventy chapters, the book covers almost every topic of naval science and in addition, for good measure, includes discussions of such things as national policy and geopolitics.

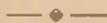
The reader is provided with a short Naval War College course in solving staff problems by means of which a "Mr. Smith," who is being evicted from his dwelling place, proceeds to estimate the situation and arrive at sound decisions in providing himself with a new home. The author takes a fling at naval ship design by presenting a unique layout of a monstrous battle carrier which he estimates could perform the missions of the carrier, battleship, and cruiser and

could therefore replace those types. This ship is to be complete with 200 planes and twelve 16 inch guns and is "a whole task force built into one hull." It is rather astonishing to read that one of its favorable features is that the conning tower will serve to finally stop planes which make improper landings. It is equally astonishing to learn that the ram bow appeared on destroyers during World War II.

The book makes reference to a scholarly bibliography and when the author uses these sources his treatment of the subject is sound. Unfortunately, when he apparently departs from that guidance and proceeds on his own, the views and conclusions then presented are evidence of deficient experience and lack of grounding in naval science.

The author indicates in Chapter I that his purpose in writing the book is to offer an appeal for maintaining a large military establishment in time of peace, although such direct appeal appears to be confined to the preface and the introduction.

Despite its deficiencies in fact and theory, there is much in this book to interest the military man. Among other chapters those on electronics, relative movement, radar and fire control contain basic information clearly presented. Thus the book will be of value to the newly commissioned officer because of its wide coverage of such fundamental information. For the more experienced officer, it will have value as a reference book, and for the interest it will provoke as the author concerns himself with the strategical and tactical weapons and techniques of the warfare of the future.



Elementary Nuclear Theory, by Hans A. Bethe (Wiley, \$2.50).

Reviewed by  
Carl D. Anderson

**T**HE NEW book, *Elementary Nuclear Theory*, by Professor H. A. Bethe should enjoy a wide reading and fill a real need in the training of students in the important and intricate subject of nuclear physics in the various schools, colleges and research laboratories of the nation. The volume is accurately described by its subtitle, *A Short Course on*

*Selected Topics*, for it is actually an edited collection of notes of a series of lectures given by the author to engineers and scientists. It is brief, less than 150 pages, condensed, and in no sense is it a textbook on the subject of nuclear physics.

It is *elementary* only with respect to nuclear physics itself. It presupposes on the part of the reader a considerable training in mathematics, a rather comprehensive grasp of atomic physics, and a more than elementary knowledge of the quantum mechanics.

Perhaps one of the most important weaknesses in the whole program of providing adequate training in nuclear physics at the present time is the complete lack of a textbook for classroom use which is up-to-date, authoritative and written at a level of difficulty suitable for the serious student of nuclear physics. The several descriptive and semi-popular expositions of the subject which are available today do not fill this need. Professor Bethe's articles on the subject of nuclear physics written for the *Review of Modern Physics* (Vol. 8, p. 83, 1936; Vol. 9, pp. 69 and 245, 1937) in spite of their age, and in spite of the tremendous development of nuclear physics in the last decade, are still used as classroom texts in many a college today, and as the standard reference "bible" in many a research laboratory. It is for this reason that the appearance of Professor Bethe's new volume is so welcome at this time. It will in part meet the need of a suitable text, and will supply a large amount of information much of which at present can be found only in widely scattered sources in original publications in the research journals.

The book deals throughout with the basic and fundamental properties of nuclear systems, and properly omits entirely a discussion of many nuclear phenomena of a more special character, the most notable example of which is nuclear fission which receives no mention at all. The greatest emphasis is given to the problem of *nuclear forces*, which is the basic problem of nuclear physics today. The theoretical treatment of nuclear forces is brief and of necessity incomplete as no satisfactory theory of this subject has yet been devised.

Very few are there among the physicists of the country today who would not profit by a careful reading of Professor Bethe's little book. Professor Hans Bethe is one of the world's most distinguished nuclear physicists, and is noted also for the clarity of his lectures and writings.



*Conqueror's Peace*, by Bud Hutton and Andy Rooney (Doubleday, \$1.50).

*Reviewed by*  
Colonel John H. deRussy

**T**HIS IS a factual account of conditions in France and Germany today as seen by two ex-GIs. The authors retrace the path of the American armies from the Normandy beaches to the heart of Germany. They compare the scenes, the people's reactions, and the relations between the French and German nationals and the American occupation soldiers of today with those that existed at the time our soldiers were battling their way across Europe. They cite incidents which either occurred during their trip and were seen by them or were verified by news accounts and official records. No attempt is made to evaluate what they saw in relation to our national investment in those countries or in relation to international politics, economics and diplomacy.

The reader will find many of the incidents which were perpetrated by our occupation soldiers and are here recounted unpleasant to believe, such as: "Uniformed bullies, swaggering down a street at night, stripping an old man of his meager belongings; or drunken soldiers yanking a girl from the side of a young man in a park at dusk; or a crowd of drunken soldiers making the conquered civilians of a little university town run a gantlet of clubs and fists at curfew time; or ..."

Intimations throughout the book that the occupation GIs and officers generally behave more disgracefully than did the wartime personnel reflect a slight bias on the part of the authors. Actually, unpleasant episodes occurred as frequently during hostilities, but were not brought to light because of wartime conditions. However, the incidents cited are facts and cannot be denied. These are acts such as we

would attribute to the Nazis and are the sort of thing we fought to stamp out; yet, here are verified accounts of the barbarousness of our own occupation soldiers. Through this method of citing incidents as examples, the authors point out to the reader how "the American public, to a large degree, chose to delude itself into thinking that its soldiers were Eagle Boy Scouts." The book in all its implications emphasizes the necessity for developing a realistic view of the occupation and our investment in Europe.



Men Against Fire, by S. L. A. Marshall (Morrow, \$2.75).

*Reviewed by*

Major Francis S. Tennant

**T**HIS BOOK is full of knowledge gained by the author while investigating and observing war at the front in both the Pacific and European theaters. It contains lessons which will help all officers to better understand the science of warfare. The author readily admits that Air Power is essential to national survival, but claims that Air Power unsupported by the ground forces of the battlefield is a military means without an end.

Prewar indoctrination of officers and men to the realities of the battlefield is advocated. "Troops are truly prepared to establish order on the battlefield only when in the course of intelligent training they have been well forewarned of the kind of disorder they may expect there. The price for failure to train men in the realities of the battlefield is paid all up and down the line; men go into action the first time haltingly and gropingly as if they were lost at night in the deep woods. Lives are wasted unnecessarily. Time is lost. Ground that might be taken is overlooked. Fear is ever present, but it is the *uncontrolled* fear that is the enemy of successful operation, and the control of fear depends upon the extent to which all dangers and distractions may be correctly anticipated and therefore understood."

A number of changes in the way battle is waged are suggested, such as an equalization of the flow of information from rear to front, thus giving the small unit commanders

information as to how well they are succeeding. "Nothing succeeds like success." Communication between individual fighting men is as important as their fire power. "Within the small unit, the loss or lack of control was almost always traceable to the failure of close up communications. The failure was not caused by the enemy, but by neglect of our own soldiers to keep contact by common sense measures of talking to each other."

Impressively recorded is the fact that when troops engage the enemy, not more than one quarter of the total will strike a real blow unless they are compelled by almost overpowering circumstances or unless all junior leaders constantly "ride herd" on troops with the specific mission of increasing their fire. This ratio stands for seasoned troops as well as green troops. *Seventy-five percent of the troops will face the dangers of battle, but they will not fight.*

Listed as follows are the characteristics required in commanders if they are to prove capable of preparing their men for and leading them through the shock of combat:

(1) Diligence in the care of men.

(2) Administration of all organizational affairs such as punishments and promotions according to a standard of resolute justice.

(3) Military bearing.

(4) A basic understanding of the simple fact that soldiers wish to think of themselves as soldiers and that all military information is nourishing to their spirits and their lives.

(5) Courage, creative intelligence, and physical fitness.

(6) Innate respect for the dignity of the position and the work of other men.

In the author's opinion "the fault in our disciplinary level during World War II was not primarily that the discipline of the ranks needed to be more relaxed but that the discipline of a considerable percentage of our officers needed to be tightened." In short, "When slackness is tolerated in officership, it is a direct invitation to disobedience, and as disobedience multiplies, all discipline disappears."

Human Factors in Air Transport Design, by Ross A. McFarland (McGraw-Hill, \$6).

Reviewed by  
Colonel Don Flickinger, MC

PERHAPS the greatest problem which confronts the military flight surgeon today is that of protecting the aircrewman from the increased physical stresses imposed upon him by tactical aircraft. Until the past few years, it has been relatively easy to maintain the pilot on better than equal footing with his machine but today, military aircraft design and performance have developed rapidly to such a high degree that it is becoming increasingly more difficult to match human tolerances to the inherent capabilities of the airplane. It may well be that the foreseeable future will see the perfection of pilot-less combat aircraft, but until that time comes the pilot is the limiting factor in the development of tactical aircraft.

It is the firm conviction of Dr. Ross McFarland that much can be done to increase the comfort and safety of both crews and passengers in air transports through the intelligent application of human engineering principles into their design. His chief premise, which is certainly a timely one, is that aircraft engineers should work hand in hand with those who specialize in the human factors involved in air travel and should give much more consideration to the human element in aircraft design than has been their wont in the past.

Although accurately depicting his chief theme, the title of the book *Human Factors in Air Transport Design* does not do full justice to the great wealth of valuable material contained within its pages. Dr. McFarland, one of the modern pioneers in commercial aviation medicine draws from an exceptionally rich background of knowledge and experience in this subject. He has painstakingly outlined in commendable scientific detail the full spectrum of human tolerances to the multiplicity of physical stresses which are imposed upon man in flight. This careful and complete exposition of psycho-physiological tolerances is of itself alone quite an achievement and worthy of time spent in careful perusal of the book. However, the full value and impact of Dr. McFarland's work emerges from the convincing manner with which he

applies this knowledge of the "human factor" to practical aircraft design and operation. Not only are specific engineering and operational recommendations made after each particular physical factor is discussed, but considerable proof is given to show that engineering and operational demands would not be compromised by giving full consideration to the human aspect.

Throughout the entire book, McFarland keeps reiterating the fact that physical and mental comfort of the aircrewman is the most significant factor in safe, efficient operation of the aircraft. This is a potent message with great significance to military aircraft designers and flight surgeons alike, and unfortunately even today we are not heeding it in any appreciable degree. The custom has always been to design and fabricate a tactical airplane which may be the delight of the aerodynamicist, but at the same time is the despair of the aircrewman who is required to operate it. One need only to query aircrews following the completion of long missions in either fighter or bomber aircraft to become assured on this point. Fatigue and discomfort are universal amongst these men following long flights in military aircraft today, and one cannot help wondering how much of the potential combat performance of the aircraft is compromised or neutralized by the reduced physical and mental efficiency of the airman. After careful assimilation of McFarland's tenets, one is convinced that only through complete integration of human engineering principles into military aircraft design and operation can the ultimate achievement be realized in Air Force missions. The outcome of the next air war may well rest upon the superiority of the human element rather than solely that of the vehicle.

Dr. McFarland has made a notable contribution to aviation and aviation medicine and his excellent treatise should be read by all flight surgeons and those Air Force officers who are responsible in any way for present day aircraft design and tactical performance. It can be safely stated that in the field of aviation medicine his book is second in importance only to the standard text in the field, Armstrong's *Principles and Practice of Aviation Medicine*.

Strategy in World War II, by Lt. Col. Alfred H. Burne (Military Service, \$1.75).

*Reviewed by*

Lt. Col. Jesse O. Gregory, CAC

COLONEL BURNE is doubtless a fearless soldier and writer. He charges merrily through the subjects of Atomic Power, Air Power, Naval Power, strategy, tactics, grand strategy and national policy in no less than five small pages of large type. The reader emerges from this ordeal thoroughly fatigued and confused. Perhaps this is a good beginning, because the remaining eighty odd pages can then be consumed with little or no additional pain.

The book has an interesting central theme which argues that an enemy must be crushed against an inelastic wall to make a victory decisive. "If we wish our blow to break up the hostile army we must first insure that there is something solid behind it." This concept has considerable merit and Burne is probably correct in saying, "It has not been stressed by (previous) military writers." He attempts to prove his point by extremely shallow analysis of each major ground campaign of World War II. A detailed discussion of one or two operations would have been more convincing. It is doubtful whether the subject matter pertaining to these campaigns is at all well documented. Certainly there are few references, although the earlier discussion of strategical theory contains numerous references to the works of recognized authorities.

Nowhere is it admitted that Air Power may provide the "something solid" behind the enemy army. In fact, the author says, "From my point of view there are two and a half rather than three services." The half service he refers to is the Air Force when employed in tactical operations.

The discussion of the principles of strategy is often vague and superficial. Certainly no significant contribution is made to the theory of strategy by such a statement as, "The Principle of 'Economy of Force' is a good example of a principle which has been expanded to such an extent that it has lost all clear outline; and hence most of its practical value."

Admiral Halsey's Story, by William F. Halsey (McGraw-Hill, \$4).

Reviewed by

Colonel Wilburt S. Brown, USMC

THIS BOOK will be certainly one of the source books which future historians of the war in the Pacific will consult and quote. Portions of it will be contradicted. Particularly will the Battle of Leyte be a bone of contention between ardent proponents and opponents of whatever or whoever is under examination. That portion of Halsey's story is as forthright as his entire book. He characterizes the book as a report and as such he wrote it interestingly and well.

In this technical era of machinery and machine-like precision of staff planning, the colorful characters that gave glamour to our military and naval history seem to be passing. Forrest, Custer, Jeb Stuart, and Wheeler would not have enjoyed this war at all, nor would Farragut, Porter, or Dewey. Halsey may have been the last old "sea-dog" to grace the pages of naval history, but grace it he certainly did. His decision to commit everything he had to the support of the Guadalcanal campaign and either succeed or fail with the troops and planes ashore, marines, army, and navy; air and ground, was sheer high romance. Had he failed, and his naval losses were heavy, nearly as heavy as the Japanese losses, we would have lost that campaign and greatly lengthened the war, at least. The arm chair strategists would have given him no more glory than Custer got from the Little Big Horn, nor than Craddock got from the Coronel Islands. But every man who was in the South Pacific will remember the tremendous lift in morale when Halsey took command and nobody will ever forget his order to all combat commands on October 23, 1942, "Attack Repeat Attack."

Maybe we are headed for push button warfare where inspirational leadership will not be necessary. Maybe we are mechanized enough that we could have dispersed with it on all high levels in the past war, but the survivors of the 1942-1943 campaign in the South Pacific will never agree.

In any case, Halsey's own *Story* is very interesting reading and is highly recommended by this reviewer.

## BRIEFER COMMENT

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Air Power and War Rights, by J. M. Spaight.

NOW published is the third edition of this basic study on the international law of war and neutrality as applied to Air Power. This body of law is here reviewed against the background of World War II and its aftermath. Specific problems which are examined are those of the bombing of target areas instead of particular objectives; the declaration of danger areas at sea in which ships may be bombed at sight; the intercalation between belligerency and neutrality of a new condition known as non-belligerency; the hazards of civil aviation in wartime; the place and future of atomic weapons in the armory of war. The emergence of these and other questions demands this re-examination of the law and custom of war in the air.

Longmans \$10

The Problem of Reducing Vulnerability to Atomic Bombs, by Ansley J. Coale.

"VULNERABILITY [to atomic bombs] is a problem which, if its gravity is appreciated, would have a wartime urgency: the urgency of national survival." Such precise and straightforward statements indicate the value of this book which was prepared under the direction of the Social Science Research Council. Mr. Coale does not seek to give final answers but rather, by analysis and synthesis, to show the exact nature of the questions awaiting answer. That this estimate of the situation is dispassionately realistic follows from the conclusion that "the most important reason for preparing to

win an atomic war would be to avoid having to fight it."

Princeton \$2

New Weapons for Air Warfare, edited by Joseph E. Boyce.

THE LAST issue of this journal contained a review of James Phinney Baxter's *Scientists Against Time*, Pulitzer prize winner in history and first of the *Science in World War II* series--this is the second volume and it measures up to the standards of the first in fullness of coverage, smoothness of presentation, and appeal to reader interest. This volume is of special concern to Air Force personnel, inasmuch as it tells the story of the development and utilization of guided missiles. They are all mentioned here, Azon and Razon, Felix, and Pelican and Bat, the different kinds of fuzes, radar, Roc, the whole repertory, neatly described and well illustrated by eighteen photographs. Here is a comprehensive history of this entire field--now those who used some of these weapons, and helped to develop them in action, can obtain an over-all view of this immense and important project, which has an almost stupendous significance for the future.

Atlantic-Little, Brown \$4

International Politics, by Frederick L. Schuman.

THIS standard work was compiled in its third edition before the atomic bombs were dropped. Yet the penetrating analysis of power politics contained here has not been refuted by the rush of world

events. Before Pearl Harbor Professor Schuman predicted, "Should Russia...clash with the West in the wake of a Fascist debacle, a new world war would flame out of the still red ashes of the old." The study of world power relationships is developed in four parts; the rise of the world society, world order, world anarchy, and toward tomorrow. The final section surveys the present age of empires in terms of the world revolution, the stakes of war, and the new world order.

McGraw-hill \$4.50

**We Dropped the A-Bomb**, by Merle Miller and Abe Spitzer.

SOMETHING of how it felt to drop the atomic bombs on Hiroshima and Nagasaki can be learned from this eye-witness account told by the radio operator of the *Great Artiste*, one of the three planes that flew on these historic missions. Here is what the terrific explosion seemed to be like, what the crew members saw, how it affected them, and how they think the atomic bomb is going to influence the course of history. This book is significant only as a description of an intensely impressive experience.

Crowell \$2

**World Economics**, by Ernest Minor Patterson.

PROFESSOR Patterson's new book undertakes to survey the world as a vast economic area by examining its population and resources and the business relations between its parts. This is not a volume on "current problems." Of its eight parts, only the last, *Current World Conditions*, emphasizes recent developments, since

the purpose throughout is not to discuss immediate issues so much as to furnish background. A broad introduction to the field, its first three parts deal with such fundamental information as Population, Natural Resources, and The Relation of Resources to People. This inspection of international economics teaches much about basic war potentials.

Macmillan \$5

**Visibility Unlimited**, by Ernest G. Vetter.

SUBTITLED, "An Introduction to the Science of Weather and the Art of Practical Flying," this book presents in detail the related subjects of meteorology and navigation with such admirable simplicity and clearness that they can be readily understood by readers with no technical background. The treatment is too elementary to be of interest to technically trained personnel, but as an introduction to the subjects covered the book has merit.

Morrow \$5

**Congressional Elections, 1896-1944**, by Cortez A. M. Ewing.

HERE is an analysis of the sectional basis of political democracy in the House of Representatives over a fifty-year period. During this time an expanding American economy placed many new responsibilities upon the Congress; and demands were heard from every quarter for it to provide more and better means to the good life. The author's data is based on constituency election returns, which prove so ideologically contradictory as to produce a significant conclusion: "We play our politics to win, and our tactics, within the limits of

decent precedents, are developed for the purpose of sending our representatives to Washington."

*University of Oklahoma \$2*

**One, two, three...infinity**, by George Gamow.

PROFESSOR GAMOW, who during the war was atomic energy consultant for the AAF and the Navy, is the author of *The Birth and Death of the Sun*; he is also a guest lecturer at the Air University. His new book, *One, two, three...infinity*, is a scientific discussion for the layman, but it should be made clear that this is not for the layman who is a scientific illiterate; although 'popular' in style, this volume is not vacation reading. The problems it deals with are fascinating (Can space be turned inside out?), and by reading attentively one may learn many new facts and theories about physics, chemistry, biology, and mathematics (relativity and the fourth dimension are thoroughly dealt with), and one's scientific imagination may be healthily stimulated. The book is fully and cleverly illustrated by the author.

*Viking \$4.75*

**Safe for Solo**, by Frederick M. Reeder.

HERE IS an easy to understand book of elementary flight instruction which may well set a precedent in readable textbooks. It has been put together with enthusiasm for flying reflected on every page. The author's ability to explain simply and clearly what a beginner should know about flying lifts this book well above the ordinary flight instruction manual. The 262 illustrations which are an integral part of the text were done by Bob Osborn, well known to pilots for his wartime Dilbert cartoons.

*Harper \$3.75*

**Soldier's Album**, by R. Ernest Dupuy and Herbert Bregstein.

APPROPRIATELY subtitled, *The SHARP Pictorial History of the War in Europe*, this is a picture record of the defeat of the Wehrmacht on the Western Front. Beginning with the preparations for the invasion of Normandy, the story of the assault, penetration, and collapse of fortress Europe is unfolded in these visual scenes of battle. The 150 pages of photographs are brought into focus by a running commentary of text. This book portrays the devastating work of the Allied Air Forces, the effect of Germany's secret weapons, the moods and expressions of all those groups that are born of war -- refugees, prisoners, the hierarchy of defeated warmongers, the combat infantrymen.

*Houghton Mifflin \$5*

**The American Federal Government**, by John W. Ferguson and Dean E. McHenry.

THIS scholarly volume covers the basic features of American federal government. In three sections, the book first deals with historical background, general principles, and other essentials. The second division includes a discussion of Congress, the President, the courts, and federal powers. Part III is devoted to federal administrative organization and functions, providing an introduction to the highly important fields of public administration and government regulation. Chapters on foreign relations, national defense, and territories define the problems arising from the new position of power and leadership in which the United States finds itself following the war.

*McGraw-Hill \$3.75*

Sweden: The Middle Way. by Marquis W. Childs.

MR. CHILDS has again brought up-to-date his survey of Sweden, originally published in 1936. One of the most valuable books of its kind, it deals extensively with the co-operative movement in a country which held to a precarious neutrality during World War II and is at present none too secure, because of its desirable uranium deposits--Sweden is a kind of middle ground between the antagonists of power politics. Yet her internal economy has remained healthful, despite current housing shortages and continuance of food rationing. Mr. Childs' book is a thorough consideration of these and other matters, most valuable perhaps for its complete examination of every phase of life in modern Sweden. The photographs, particularly of the co-operative apartments, are excellent and illuminating.

Yale \$3

New Zealanders in the Air War, by Alan W. Mitchell.

IN THIS small book Alan Mitchell has vividly described the achievements of some of the New Zealand members of the Royal Air Force and the Royal New Zealand Air Force. To many Americans the names of "Cobber" Kain, "Popeye" Lucas, Sergeant Jimmie Ward (VC), and Air Vice Marshal Keith Park are well known; and we at Air University will recall Wing Commander Alan Deere, the most colorful of all New Zealand fighter pilots, who was a student last year in the Air War College. This is a most interesting and dramatic story about the daring exploits of men who fought zealously and died bravely in the air war over Great Britain and the continent.

Harrap & Co., London, 2/6

Man and The State.

SUBTITLED *The Political Philosophers*, this is the latest volume in the series, *The World's Great Thinkers*, edited by Saxe Commins and Robert N. Linscott. Man's relationship to the state is evaluated by Thomas Hobbes, *Of Commonwealth*; John Locke, *On Civil Government*; John Stuart Mill, *On Liberty*; Jean Jacques Rousseau, *The Social Contract*; Henry David Thoreau, *Civil Disobedience*; Adam Smith, *The Wealth of Nations*; G. W. F. Hegel, *Philosophical History*; Karl Marx, *The Communist Manifesto*. These selections constitute an unusually choice representation of the classics of political philosophy.

Random House \$2.50

Sociology, by Richard T. LaPiere.

THIS BOOK presents in simple language and in terms of our times what sociologists have so far discovered about social life in general and about our own society in particular. Society is analytically dissected into its component systems: technologies, ideologies, and organization, in an attempt to demonstrate the interdependence of the various elements. Of particular interest are the comments on war in the modern world and the social consequences of war. Professor LaPiere concludes that, "The nations of the modern world are in irresolvable conflict with one another, for nations and nationalism are ideological and organizational contradictions to the productive techniques and procedures that such tangible modern devices as the automobile, the steamship, and the airplane represent."

McGraw-Hill \$3.75

# AIR MAIL\*

To The Editor:

The article "Geopolitics versus Geologistics" by Lieutenant Colonel Harry A. Sachaklian, which appeared in the last issue of the AIR UNIVERSITY QUARTERLY REVIEW presents a challenge. Discussion in this field is to be encouraged. But the high aims of the AIR UNIVERSITY QUARTERLY REVIEW are, in my opinion, not served by an academic quibble about the term "geopolitics." I say this because his article is virtually another repetition of objections to the German version of geopolitics. His argument is certainly not directed at what Father Walsh, of Georgetown University, in his recent address to the Air University called "legitimate geopolitics."

Colonel Sachaklian's article is based on a number of wrong assumptions. His principal error is to ascribe the origin of geopolitics to Haushofer and his *Institut fur Geopolitik*. All authorities, including Haushofer himself, have acknowledged Sir Halford J. Mackinder as the true pioneer of modern geopolitics. It was Mackinder who in 1904 evolved the "heartland theory," which the article concedes to be the "basic theme of geopolitics."

Starting with this assumption, the article continues with the premise that the originator of a term has the sole right to define it, and concludes that Haushofer's adoption of the term "geopolitics" made it synonymous with German neo-imperialism. The meaning given to it by its originator Rudolf Kjellen -- the study of the earth and the state -- still stands. The charge that the term is Germanic in origin is, to put it mildly, pointless. There are many terms of Germanic origin used in science, medicine, art and music which are perfectly acceptable and clear. Actually the word "geopolitics" has its roots in Greek and its only claim to Germanism lies in its adoption by Haushofer and his Munich school as *geopolitik*. The distinction between *geopolitik* and

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\* With this issue the AIR UNIVERSITY QUARTERLY REVIEW inaugurates a Letters to the Editor section to be known as "Air Mail." This new section is provided to broaden the opportunity for discussion of the concepts and doctrines of Air Power as presented in the QUARTERLY REVIEW. Appropriate contributions will be welcomed.

"geopolitics" is constantly emphasized by all writers on the subject, and it has been re-stated in letters recently received by me from leading American authorities. From these letters I shall later quote.

Unless everyone accepts Colonel Sachaklian's limited interpretation of geopolitics, the charges and claims made by him cannot be substantiated. His proposed substitution of the word "geologistics" for "geopolitics" does not satisfactorily solve the problem for a system of world appraisal. Beginning with a survey of material resources for the purpose of employing them to the benefit of the human race, his theme developed into several startlingly unrealistic proposals. Colonel Sachaklian would use power politics to create world prosperity and in so doing impress other peoples with our deep spiritual sincerity. Certainly, one would have to live in a world of fables to accept his "geologistics" as a panacea for all the world's ills.

Fault may also be found with the word he has coined. "Geologistics" is made up of two words with recognized meanings. These, evidently, were not taken into consideration by him in arriving at a definition. It is really a pseudo name and open to considerable misinterpretation. "Logistics" is a recognized military term which in Funk and Wagnall's dictionary is defined as "the branch of military science that embraces the details of moving or supplying armies and the general conduct of a campaign." The prefix "geo" would tend to enlarge the scope of the word, but it would not modify its meaning. By forming the word "geologistics," Colonel Sachaklian does exactly what Haushofer's disciples did when they added the prefix "geo" to all fields of human endeavor to make up terms which they then defined for their own purposes.

I stated earlier that I had corresponded with leading American authorities regarding this subject. The replies of several may be of interest. Dr. M.S. Reichley, Director of Technical Analysis of the Industrial College of the Armed Forces in Washington, D.C., in a letter, dated 29 October 1947, wrote as follows:

"A few months ago we received a letter from a member of your faculty, Lt. Colonel Harry A. Sachaklian in which he asked our opinion concerning the substitution of the word "geologistics" for "geopolitics." We answered him at that time, briefly stating that we were going to continue the use of the word "geopolitics" as we believed the word "geologistics" to be too narrow.

"I favor the continued use of the word "geopolitics." Admittedly, popular conception of the word ties it immediately to Nazi Germany, but I see no reason why this should eliminate the use of the term in the United States. After all an entire city is not condemned merely because a few bad people live there. I feel quite certain that the term will continue to be employed in the universities and colleges of the United States. I know definitely that it will be used here, at the Industrial College and also at the school of Foreign Service, Georgetown University."

About the same date, I received a letter from Colonel H. Beukema, Professor of Economics, Government and History at the United States Military Academy at West Point, for whose opinion I had asked. To my inquiry he replied:

"Your letter led me to look through a rather substantial file of writings in the geopolitical field which I have accumulated in the past twenty years. In so doing I was struck by the fact that almost every scholar who has investigated any aspect of the field, keeps his analysis anchored to the basis of his pet specialty.

"Karl Haushofer, first of the "Whole-hoggers" in his claims for the universality of geopolitical coverage, takes the spatial aspect of states merely as a point of departure before swallowing up the entire range of human activities and the physical resources which support those activities. Thereafter, psychology, philosophy, religion, and all the other expressions of mind and spirit are duly allotted their prefix of "geo" and then neatly fitted into an equation of Teutonic superiority. The final synthesis, as you know, leads inevitably to Germany's world dominance as a logical consequence of superior merit and incontestable claims. That is the point where objective study becomes a mixture of psychopathic bunk and vicious propaganda. For which reason I label it "geopolitik" in contradistinction to geopolitics."

The interpretation and use of the term "geopolitics" in America, is, as Colonel Sachaklian has pointed out, loose and unscientific. But only the Haushofer school considered geopolitics as a "science"; all other authorities admit that it is a pseudoscience. Therefore, the use of the term "geopolitics" will continue to be loose in America, since geographers do not agree any more than generals do.

To Colonel Sachaklian's complaint that he could not find a standard definition of the term "geopolitics," Colonel Beukema, in the same letter, stated that he was "glad to leave it to others who wish to button up these concepts within the limits of the pat definition and to quarrel among themselves over their brain children."

In contrast to the charge that "there are as many interpretations of geopolitics as there are authorities," I would like to draw attention to the general agreement among the various military and civilian authorities quoted in this letter. It is true that before and during the recent war, many writers went all out in attacking geopolitics as the evil power which motivated Nazi aggression. Some of these articles were obviously written with an eye towards sensationalism. Now that the war hysteria has died down, it is possible to make appraisals with a clearer perspective. Professor Griffith Taylor, President of the Association of American Geographers, agrees that the Haushofer concept of geopolitics was in consonance with German ideology.

"Haushofer and his school seem to imply that geopolitics necessarily includes discussion of world domination and racial superiority. These are arbitrary and unnecessary extensions of the term "geopolitics." The latter may be defined as the study of the outstanding features of the situation and resources of a country with a view to determining its status in world politics."

Derwent Whittlesey, Professor of Geography at Harvard University, in a letter dated 23 October 1947, made the observation that usage of the term "geopolitics" has been ambivalent -- sometimes as a synonym for the German "*geopolitik*" and sometimes as the antithesis of it. He concluded

with the recommendation to establish "geopolitics" as a term dissociated from the German "*geopolitik*" and to adhere firmly to its meaning. In his letter he also made a distinction between the two most closely allied fields of special study -- political geography and geopolitics -- in the following words:

"Political geography is a well established term, meaning the objective study of all the phenomena that integrate political affairs with earth conditions. If your work is confined to such a strictly objective study, I believe this is the name that suitably describes it. Advantages include the following: it defines itself, it is well established in literature and it has no misleading or ambiguous connotations. The name is, however, cumbersome, especially in its adjectival form, "political-geographic." If you do not go beyond the purely objective study that would be made in a university, "Political Geography" will cover your needs.

"If you formulate policy and adopt programs of action, you need some other word, and I can think of no better name than geopolitics. It seems to me that Nicholas Spykman worked in geopolitics in this sense whenever he proposed national policy resting on earth conditions. I see nothing invidious in this. Any state which does not have a national policy is blameworthy and any policy which does not rest on earth conditions is faulty."

The study of geopolitics builds up valuable background for leaders, both military and civilian, since it considers the development of a people as influenced by their position and surroundings. It covers a survey of all elements which will be ultimately expressed in strategy. In fact, military and political strategy have become so closely interwoven that some military authorities are advocating the elimination of the word "military" from the long-established expression "military strategy." The evolution of man's command over natural resources for his advancement or destruction has blanketed the globe in its scope. Dr. Bruce Hopper, during his courses at Harvard University this year, is using the terms "world strategy" and "global strategy" when covering the fields which concern those who are charged with

national defense.

Furthermore, the study of a state in order to determine its status in world politics is in accordance with the proved military doctrine of estimating the situation, then of evaluating all possible courses of action which are open for adoption, and finally, of deciding on the course of action which offers the most possibilities for attainment of the objective. This is precisely the method now used by the United States Department of State in arriving at policy decisions. In such a study there is no need to adopt the theories of leading geopoliticians. Its purpose is to widen the scope of thinking to global terms. It serves as a basis on which concepts of human relationship can be developed as seen in the light of present conditions, and a full realization of what the air age means.

Colonel G.A. Lincoln, who for more than four years was head of the Strategy and Policy Group of OFD, made the following comment to me last month:

"Geopolitics has never meant more to me than the logical application of geographic facts and economic and political principles to the different areas and national groups which compose the world. That does not differ from applying rhetoric, penmanship, mathematics, engineering and a knowledge of law to the production of a report on the feasibility of a river-and-harbor project. In short,... the application of an education."

The viewpoint of Colonel Lincoln summarizes my thoughts succinctly. In the final analysis, the study of geopolitics does not produce mystic power to solve problems of world relations any more than a medical education creates a great surgeon.

Max Van Rossum Daum, Major, USAF

AIR COMMAND AND STAFF SCHOOL  
MAXWELL FIELD, ALABAMA

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## THE CONTRIBUTORS

Col. Noel F. Parrish, is a former cavalryman who was wartime commander of flying training at Tuskegee Institute; a recent graduate of the Air Command and Staff School, he is currently studying at the Air War College. . . James L. Cate, Ph. D., Associate Professor of Medieval History at the University of Chicago, is one of the editors of the projected *Official History of the AAF in World War II*. . . Maj. Alexander P. de Seversky, Air Corps Reserve, latest winner of the Harmon Trophy, is an internationally famous authority on the tactics and strategy of air warfare; his advanced ideas on combat aircraft design were substantiated by the events of World War II. . . Wing Comdr. E. A. Howell, RAF (Retired), author of *Escape to Live* (Longmans 1947), was wartime commander of a fighter squadron, a member of the Air Staff, British Air Ministry, chairman of an Anglo-American weapons committee, and a member of the Joint Target Group, Washington. . . 1st Lt. William J. Rand, at present a student of electrical engineering at Syracuse University under the civilian institutions program of the Air Force, was an instructor in the New Developments Division of the Air Command and Staff School last year. . . Col. Louis E. Coira, a recent graduate of the Air Command and Staff School, was engaged in patrolling reconnaissance with the 6th and 20th Air Forces during the war; he is currently assigned to USAF Headquarters. . . Maj. Gen. Muir S. Fairchild, was, at various times, Secretary of the Air Staff, assistant Chief of the Air Corps, Director of Military Requirements, and, prior to his assignment as Commanding General of the Air University in 1946, a member of the Joint Strategic Survey Committee of the Joint Chiefs of Staff. . . Col. Dale O. Smith, last year chief of the Research Division, Air University, who is now studying at the Air War College, was on the General Staff of the anti-submarine commission during the war. . . Hilton P. Goss (Ph. D. University of California), former AAF historical officer of the Air Transport Command in Africa and Europe, is a member of the Documentary Research Section, Air University Library. . . Capt. Willard J. Suits, USN, Air Command and Staff School instructor, formerly on the faculty of the U. S. Naval Academy, was commanding officer of the cruiser *Pensacola* during World War II. . . Carl D. Anderson, Ph. D. Professor of Physics at the California Institute of Technology, received the Nobel Prize in physics in 1936 during the war he was engaged in the development and application of aircraft artillery rockets. . . Col. John H. deRussy, assistant chief and instructor in the New Development Division, Air Command and Staff School, planned air-ground coordination as Director of Operations, Hq., 8th Air Force. . . Maj. Francis S. Tennant, Air Corps Reserve, served with the Air Transport Command in World War II, he is National Historian of the Reserve Officer's Association and is writing a twenty-five year history of that organization. . . Col. Donald Flickinger, MC (M.D., Stanford) Director of Research, Air University School of Aviation Medicine, was wartime tactical flight surgeon with VII Fighter Command in the Pacific. . . Lt. Col. Jesse O. Gregory, CAC member of the Evaluation Division, Air University, served as flight intelligence and analysis officer with Hq., 8th Air Force during the war. . . Col. Wilburt S. Brown, USMC instructor in the Naval Division, Air Command and Staff School, veteran of the Nicaraguan Campaign, was wartime commander of artillery for the First Marine Division.

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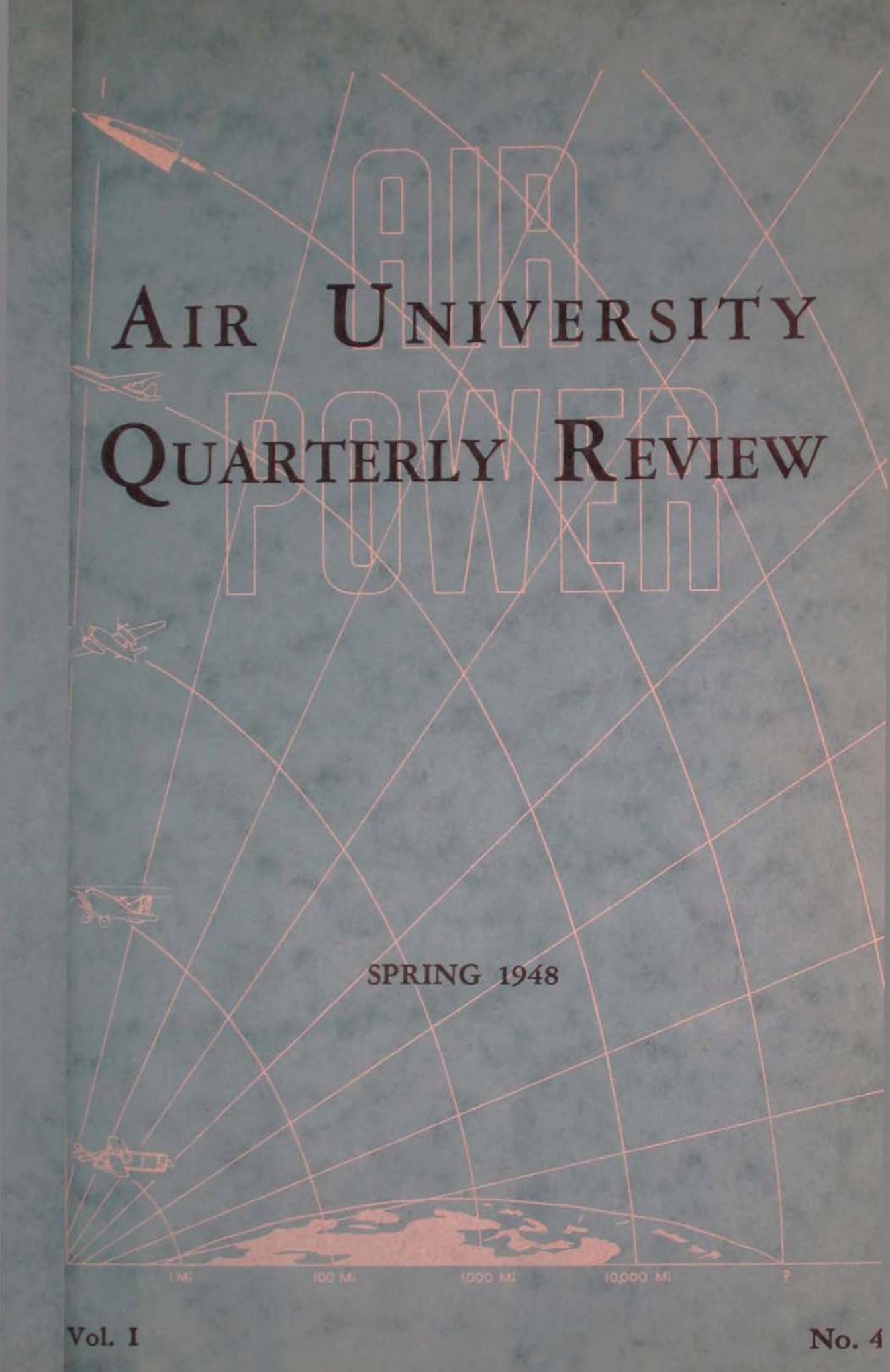
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**AIR UNIVERSITY**  
**QUARTERLY REVIEW**

**SPRING 1948**

1 MI

100 MI

1000 MI

10,000 MI

?