MONOGRAPH SUBJECT NO. 2-82.

BRIEF.

SUBJECT: The Theory and Practice of Air Warfare, 1918-1939.

My subject today is the theory and practice of air warfare from 1918 through 1939. I shall cover this subject in four phases: first, the situation at the end of World War I; second, the changes during the period between wars; third, the accomplishments and lessons to be learned during the minor wars and the opening phases of World War II; and, fourth, conclusions and recommendations as to the future organization and doctrine for employment of military air forces.

At the close of world War I we find that the airplane, a relatively new war weapon, had become an important factor, but, due to the reticence of older leaders, had not reached its manhood. True, much progress had been made. The basic fundamentals of war were found to apply equally to the air force. Organization progressed from "solo" missions to squadron missions. Air forces were used for reconnaissance, counter reconnaissance, fire direction, submarine detection, and, in certain instances, to support ground troops, particularly in Palestine and at Amiens. Bombing missions were also made. Near the end of the war Great Britain organized and used an Independent Bomber Command to strike industry in Germany. Marshal Foch had plans for an Allied Bombing Force for use in planned strikes on industry and lines of communication. So we find the beginning of a concept for strategic air, little if any concept for light craft (fighters), and no complete air doctrine.

Soon after the close of World War I, General Douhet of Italy, after intensive study, published his concept for future use of

air forces. This theory was, in essence, that air forces could win wars. He stated that there should be an independent air army of cruisers (bombers) and reconnaissance units, prepared to strike, with the deadliest of weapons, at canters of industry, and to continue this violent action until the enemy air forces were destroyed and his will to fight broken. He also stated that the air forces should not be required to support ground troops as they and the navy would be primarily on the defensive. This became the departure point for research in air doctrine. His theory was attacked from many angles, principally: more planes would be required than envisioned; total war was problematical; universal type planes, armed and armored as envisioned, were impossible; air forces would have to support ground operations; and air power alone could not win wars. On the other hand, many parts of his theory were accepted as sound: the air forces are a decisive element; it should be used early to disrupt production and distribution of material and destroy enemy air forces; and it should be independent.

Peacetime tests were conducted by the Air Force to determine the effect of aerial bombs on warships. The German battleship, Ostfriesland was sunk easily. On the other hand, the USS Washington, of newer design, was not sunk, even with heavier bombs than used in the earlier test. I might add that attacks on warships in the minor wars were not decisive. So, until further proof is offered under combat conditions, the navy still has its place in the armed forces.

Germany was the only country to build an army around a new air doctrine. She envisioned a total war of lightning rapidity, featuring mobile, hard hitting forces teamed with air forces. She enlarged her air organization to divisions and fleets for better control. She, like other leading nations of the world,

excepting the United States, also adopted the independent air force. We might well study this organization, in the search for a sound one, inasmuch as our own has been continuously changing since its inception. Another foreign idea is to organize the air arm into combat elements by type mission, and this also appears to be sound both for control and operational usage.

The period of the minor wars and the opening stages of World War II was the proving ground of air doctrine. We find parts of Douhet's theory proven sound: independent air arms; mass bombing of cities; and early destruction of enemy air forces. On the other hand we find the basic theory disproven, as the air force, alone, did not win any war, and we further find air forces being used extensively in close cooperation with ground troops. When Germany invaded Poland, we saw the proof of a sound doctrine. She used her air forces: first; to destroy enemy air force; second, to destroy lines of communication; third, in mass destruction of large cities; and, fourth, to support ground troops, concurrent with other operations. The world was rudely awakened to the full effect of air power and the need for proper defense. A sound organization and doctrine was needed, more than ever, to control this new force and get its maximum use.

Certain conclusions may be drawn from the above discussion, namely: the air plane is a new weapon of decisive means; a sound doctrine is vitally necessary and such appears to be that air forces must be in being at the outbreak of war ready to destroy the enemy air force, disrupt production and distribution of material, cover mobilization and deployment of other forces, and to assist those forces in combat; a sound organization is needed to properly control the air force in its mission and such an organization appears to be an independent air arm further organized into

combat elements by type mission; and, that the organization and doctrine adopted should be revised when necessary to provide a modern force, operating to carry out the policies of the nation.

In order to provide the required sound organization and doctrine for proper employment of military air forces, it is recommended that: the air force be considered a decisive element in national defense and so used; a sound doctrine be adopted to secure the maximum effort within the capabilities of the air force, such doctrine to be that the air force will be in being at the start of war/and used to immediately strike the enemy to destroy her air force, disrupt production and distribution of war goods, cover mobilization and deployment of other troops, and assist those troops in the defeat of the enemy; an independent air force organized into combat elements by type mission is best suited for adoption to most efficiently control the air arm; the organization and doctrine should be constantly revised to meet changing conditions; and that the subjects of naval air and balance of power between army, navy and air forces be studied separately.

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MONOGRAPH SUBJECT NUMBER 2-82.

THE THEORY AND PRACTICE OF AERIAL WARFARE, 1918-1939.

PREPARED BY LT. COL. DAVID MARTIN, O-42947, AGD.

TABLE OF CONTENTS

DEPARTMENT OF OPERATIONS AND TRAINING
COMMAND AND GENERAL STAFF COLLEGE
Fort Leavenworth, Kansas

27 May 1949.

SUBJECT : The Theory and Practice of Air Warfare, 1918-1939.

1. PROBLEM:

To study the concept for the employment of military air forces from 1918 through 1939; the lessons to be learned therefrom; and submit recommendations for the future employment of military air forces.

2. FACTS BEARING ON THE PROBLEM:

a. The airplane was introduced into World War I as a new weapon.

b. The full value of the airplane was not exploited during World War I, however, much progress was made in tactical use.

c. The general usage of air forces at the close of World War I was for reconnaissance, counter reconnaissance, artillery and naval gunfire direction, with some thought to cooperation with ground troops. There were rather firm ideas as to the proper employment of bomber forces.

d. After much study, General Douhet, of Italy, published, soon after the close of World War I, his concept for the future employment of air forces.

e. Several peace time tests were conducted to determine the effect of air power on warships.

f. Germany built her post World War I army around a large and powerful air force.

g. Leading countries of the world, except the United States, have seen fit to organize their air forces on an equal

status with the army and the navy, all under one head.

h. Air forces were used extensively and with varying degrees of success in the minor wars and in the opening phases of World War II.

3. DISCUSSION:

a. The more daring leaders of World War I saw the airplane as a potent new military weapon. They saw a means of going up and over the battlefield to get information of the locations and movements of enemy forces, which would be of assistance to friendly ground elements in their conduct of battle. They saw a means of carrying missiles into the heart of the enemy nation, disrupting industry which supplied enemy troops, thus reducing the enemy's means to fight.

b. The initial usage of air forces was on a trial and error basis, as they did not have past precedents to follow in establishing an organization, or in establishing a concept for employment. Therefore, it is not astonishing to find that initial use was rather unorganized, principally "solo" missions. These missions were primarily for reconnaissance, however, it soon became necessary to use air forces for counter reconnaissance, plane against plane, to keep enemy reconnaissance planes out of friendly areas. It was also learned that planes could successfully direct artillery fire and much use was made of this capability. Later, it was determined that more success was gained by sending planes out in groups, and, by the end of the war, planes were being sent out in groups of from thirty to forty planes. Fighters were used to assist and protect bombers. In some instances air planes were massed and used to support ground troops, outstanding examples being in Palestine and in the battle of Amiens, where success of ground troops was amazing. Bombing raids were conducted, although on a small scale, and the results definitely proved that product-

complete concept, became the departure point for research in air warfare doctrine. His theory, in essence, was that air power could win wars. He foresaw total war where entire nations would be involved, with air forces dealing out total destruction. (See Annex B). Our own General Mitchell advocated practically the same doctrine , however, the American public was tired of war, and his teachings were not heeded. General Ludendorff, of Germany, studied the reasons for Germany's defeat in World War I, and arrived at a concept for conduct of future wars which was published in his "Der Totale Kreig". He, too, foresaw total war. He envisioned a lightning war of movement, with air and mobile, light ground forces teamed together. It is noted that Germany rebuilt her army around this doctrine. The other nations of the world might well have taken a lesson from this, but, due to national policies, or a lack thereof, more or less overlooked it.

e. Douhet's theory was challenged by many people. These can be divided into three groups: first, those who openly opposed the theory from the start; second, those whose writings were opposed to the theory without reference thereto; and third, those whose observations during the minor wars tended to prove that parts of the theory were unsound. In the first category, General Golovine, a Russian Imperial Staff Officer, was outstanding. He gave Douhet much credit for his work and agreed that many of the principles were sound. He violently disagreed with other principles, however, generally as follows: the number of planes required would far exceed the numbers envisioned(facts and figures, later corroborated by other writers, were included); total war would be problematical in view of the work being done by the League of Nations and other agencies to outlaw such actions; it would be impossible to arm and armor planes as envisioned; logistical problems would be greater than predicted; all purpose type planes would be impractical due

to varied missions required of aircraft; ground troops would be required to enforce the will of the victor, regardless of the air effort; and, geographical, political and natural resource factors would have a determining hand in the distribution of land, sea and air forces of any nation. In the second category, our own Generals Arnold and Eaker were outstanding. They preached, in contradiction to Douhet, that air forces should work in cooperation with ground troops; that the army and the navy were not relegated to the defense; and, that a sound balance between the services should be reached to provide for proper national defense. The third category will be covered later in this study. Douhet, when questioned about his theory, stated that he would not recommend it for a country with the resources of the United States, but that his theory applied primarily to Italy. It appears that he has let theory run wild in spots. There are, however, many points in his theory which appear sound for adoption: air power is a decisive means of carrying the war to the enemy nation at the very outset of war, to reduce his means to fight and cover mobilization and deployment of our forces; air forces should be used early to destroy the enemy air force and prevent it from interfering with our own industry and military operations; balance of power between the army, navy and air forces must be determined by geographical, political and natural resource factors to provide the most effective forces to carry out national aims; and the air forces should be independant. However, in establishing a firm concept, past lessons must be studied, theories added, and the sum continually tested to insure positive, progressive results, and prevent theorizing from running wild.

f. Peacetime tests were conducted, using aerial bombs, against warships in particular, to determine their effect and see if navies could operate in areas of aerial operations. The tests on the German battleship, the Ostfriesland, and the United States battleship, the Washington, were the most noteworthy. The Ostfries-

land was sunk readily by a 2000 pound bomb in 1921. Air enthusiasts jumped at this as proof that navies were now obsolete. Here the arguments started, with good points presented by both sides. One side argued that the ship was obsolete; the other stated that she had been constructed after ships still in service and rated first class by the United States and Great Britain. One side stated that larger aerial bombs were already in production; the other pointed out that better armor and fire protection would be provided on future ships. One side stated that a stationary target with no aircraft defenses was not a true test; the other stated that had she been under way, her boilers full of steam and live ammunition aboard, any damage by bomb hits would have been magnified. In 1924, further tests were conducted on the partially completed, ultra-modern, super battleship, the USS Washington. Several 4000 pound bombs failed to sink her, she rode out a gale for three days, and was later sunk by the naval guns of a sister ship. There is little to be gained from the minor wars in this controversial subject, either. Air forces were used against warships, but, in general, the damage inflicted was negligible. Great Britain voiced confidence that her navy could operate successfully despite air forces, in view of improved construction and aircraft defense fires, and this confidence has not yet been disproven. During the Abyssinian campaign, Great Britain suddenly removed her fleet from Malta. Air enthusiasts seized upon this as an acknowledgment of Great Britain's fear of air power. However, it has long been a strategy of the navies not to let the enemy know where the fleet is located at any given time. An opinion was voiced that the fleet was short of aircraft defense means. All of this fails to prove definitely whether the navy is, or is not obsolete. So, until further tests, or results in combat, prove one or the other, it appears sound to assume that the navy still has a solid position in the armed forces.

g. Germany, perhaps, is the only nation to heed the les-

sons of World War I, theorize into the future, and come up with a firm concept of the future of air power. Hermann Goering was one of the few leaders to come out of that war with firm convictions. The German people were bitter from defeat, and this, coupled with the fact that a new political faction was coming into power, provided rich soil upon which Goering sowed the seeds for a new concept of war. Other nations permitted Germany to build her armed forces around this concept without interference. Had other nations matched her, it is quite possible that she would not have relied so strongly on her aerial future, but, as it was, her strategy was sound, and lacked opposition.

h. From the start, air force organization was on a trial and error basis for lack of past experience. Organization did advance during World War I, however, in general, the squadron was the largest combat unit. Great Britain, Germany, France, Russia and Italy did establish an independent air arm, on an equal basis with the army and the navy, which may or may not be a lesson. Since 1924, air exponents of the United States have tried to get the United States Air Forces organized along similar lines without success. They voiced a need for an army, navy and air force, all under one head, to provide the most efficient, effective means of control over all three services. In the rebuilding of her armed services, it is to be noted that Germany went in for large air force organizations, such as divisions and fleets. Some nations organized their air forces into commands according to missions, i.e., Bomber Command, Fighter Command, and Defense Command. It appears that most countries of the world have thus recognized the importance of air power, and have attempted to organize to best utilize it. We could well study this organization in other countries, and establish that organization which promises to provide the most effective control and usage. It is believed that a separate air force, organized into com-

mands by type missions, will serve this need.

i. The proving ground of air doctrine development was the minor wars and the opening phases of World War II.

(1) Little was learned in the Abyssinian campaign, the Italian air force being permitted to operate almost at will. The air force was organized along Douhet lines, but functioned in conflict therewith. The air forces were used primarily to support ground operations.

(2) The Spanish Civil War proved to be the first real testing ground for air doctrine. The air forces were again used to support ground operations. For the first time, we find large centers of population under massed bombing attacks, however, the forces were not as large as envisioned by Douhet. Many conclusions were voiced by observers from many nations, but few people took these lessons to heart. These observers pointed out: air forces must work in close cooperation with ground troops; dispersion and camouflage is necessary; centers of industry, railway yards, and bridges of all types are lucrative bomber targets; mass bombings of centers of population will not necessarily gain victory; and, effective defense measures can be taken, through organization of civilian control measures, use of anti-aircraft fires, use of aircraft to disrupt and destroy enemy bombers, and by dispersion, camouflage and shelters.

(3) The use of aircraft in the Sino-Japanese war merely tended to confirm the observations made in Spain.

(4) When Germany launched her attack on Poland, her doctrine was proven sound and successful. Many of Douhet's principles were used, but again we find air working closely and in harmony with ground troops. The air forces were used: first, to destroy enemy air forces; second, in the destruction of lines of communication; third, in mass destruction of centers of population;

and, fourth, in support of ground troops, concurrently with other actions. The world was unprepared for total war, but a need for proper defense was presented suddenly and forcefully.

(5) From the above events and observations, we find that Douhet's theory is wrong, basically, at present, as air power, alone, has not won any wars. All combatant nations have used air forces in combination with other offensive arms. We do find proof that many principles contained in his theory were sound in thought and practice. Depending on national policies as to whether or not destructive weapons of hitherto unheard of potency will be used, air power, alone, may some day be able to win wars. However, such a doctrine should not be adopted until further proof is offered.

4. CONCLUSIONS:

a. The airplane is a weapon of great potentiality, which should be used to the maximum permitted by natural resources, to effect the quickest, most economical victory.

b. A sound, proven doctrine should be adopted. This appears to be that air forces will be used at the start of war to: destroy enemy air forces; disrupt production and distribution of war materials; cover mobilization and deployment of forces; and assist ground troops to the maximum.

c. A sound organization is necessary to provide the most effecient control and employment. The desirable organization appears to be an independent air force, on an equal level with the army and the navy, all under one commander. The air force, itself, should be further divided into three combat elements, by type mission, i.e., a Bomber Command, a Tactical Command, and a Defense Command.

d. The organization and doctrine adopted should be studied and revised continuously to provide an effective force which is organized and employed to meet conditions of the present.

5. RECOMMENDATIONS:

a. That the air forces be recognized as a decisive element in national defense policies.

b. That the air forces be employed to strike the enemy nation at the moment war starts, to destroy her air forces, disrupt production and distribution of war material, cover mobilization and deployment of other arms, and assist those arms in the defeat of the enemy.

c. That the air forces be organized as an independent arm, on an equal status with the army and the navy, all under one commander, to provide proper, effective employment of all arms.

d. That combat elements of the air forces be organized into a Bomber Command, a Tactical Command, and a Defense Command to provide more efficient "mission" control.

e. That appropriate training, transport, supply and maintenance establishments be organized for efficient combat support.

f. That the organization and doctrine for employment of air forces be studied constantly in the light of new developments, national policies and the international situation, and revised when necessary, to provide required forces and sound doctrine necessary for sound national defense.

g. That naval aviation be the subject of a separate study.

h. That separate studies be conducted to determine the proper balance between air forces, the army and the navy.

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3 Annexes:

1 - Annex A - Directive dated 22 Nov '48.
2 - Annex B - Douhet's theory, by Spaulding.
3 - Annex C - Bibliography of Research.

COMMAND AND GENERAL STAFF COLLEGE

DEPARTMENT OF OPERATIONS AND TRAINING

Fort Leavenworth, Kansas

22 November 1948

MONOGRAPH SUBJECT NUMBER 2-82

Regular Course, Phase V, 1948-49

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SUBJECT: The Theory and Practice of Air Warfare 1918-1939.

REFERENCES: Spaulding, Ahriman: A Study in Air Bombardment; Brodie, Sea Power in the Machine Age; Arnold and Baker, Winged Warfare; Golovin, Air Strategy; Garnett, War in the Air; Sigaud, Douhet and Aerial Warfare; Slessor, Air Power and Armies; Mitchell, Winged Defense; Stewart, Strategy and Tactics of Air Fighting; Sherman, Air Warfare; Spaight, Air Power in the Next War; Liddell Hart, The Remaking of Modern Armies and When Britain Goes to War; Richmond, Sea Power in the Modern World; "Professional Notes: Battleship vs Airplane", Proceedings of the U.S. Naval Institute, Dec 1924; Sigaud, Douhet and Aerial Warfare; Williams, Air Power.

NOTE TO STUDENTS:

1. The references above are furnished to give the student enough material with which to begin his research. It is anticipated that the student will make use of all other available sources in order to give adequate scope to his subject and, when appropriate, to complete development of the subject to date.

2. The scope suggested below is intended as a guide only, and is not to be construed as a limitation on the student's perusal of the subject.

SCOPE:

1. The Douhet theory and its critics.

2. The development of military air forces.

3. Bombing tests against warships.
   a. The OSTFRIESLAND controversy.
   b. Tests on the WASHINGTON.
   c. Bombing of warships in the Spanish Civil War and the Sino-Japanese War.
   d. British fleet removal from Malta in the Abyssinian crisis.

4. Use of air force in lesser wars.
   a. Abyssinian War.
   b. Spanish Civil War.
   c. Sino-Japanese War.

Annex A.

DOUHET'S THEORY OF AIR WARFARE, BY OLIVER L. SPAULDING.

1. The sole objective of air warfare i s the mastery of the air. When the mastery of the air is gained, the air force should be employed in attacks against terrestrial objectives in order to break the moral and material resistance of the enemy.

2. The pursuit of any other objective is to gamble on what the enemy may do.

3. This objective requires an independent air force made up of battle units (air cruisers) and a certain number of reconnaissance units.

4. The power of the air force should be limited only by the resources of the nation. No element of the air force should be assigned to secondary missions, such as auxiliary aviation for the army and the navy, and for air protection of territory and of armies.

5. The efficacy of materials for destruction, explosive, incendiary or toxic, should be developed to the maximum; for, other things being equal, the offensive power of air forces is proportional to the efficacy of the means of destruction that they carry.

6. In the air, the distinction between the offensive and the defensvie can be made only from the strategic view point. In the realm of tactics it is nolonger possible to make a distinction between the offensive and the defensive, the conditions of air combat being the same for both.

7. The air force should be ready for action at the beginning of hostilities. Action once begun will be continued with the greatest violence against the most vulnerable targets and those whose destruction will produce the greatest effects upon the air power and the moral and material resistance of the enemy.

8. The air force should be so organized that, by its own

means, it may readily move about its own territory. Only those forces ready for action at the outbreak of hostilities will influence the decision.

9. An air force to which the nation had devoted all its resources, which is formed of a mass of battle aviation and reconnaissance, acting offensively, will gain the decision over a power which has parcelled out its aviation as auxiliaries.

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(Extract from pages 22 and 23, Book A, Bibliography).

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Annex C.