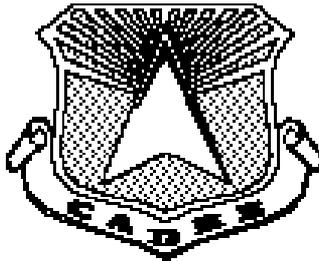


William "Billy" Mitchell's **Air Power**

Lt Col Johnny R. Jones, USAF



William “Billy” Mitchell’s Air Power

Compiled from the published and unpublished
writings and commentaries of William Mitchell by

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Contents

	Page
DISCLAIMER	ii
FOREWORD	v
ABOUT THE AUTHOR	vii
PREFACE	ix
INTRODUCTION	xi
The Essence of Air Power	1
Fundamental Truths of Air Power	5
The Aeronautical Era	15
Air Power and the Air Force	19
Air Power and Control of the Air	25
Airmen in Air Power	29
Air Power and Armies and Navies	35
Air Power and Armies	36
Air Power and Navies	38
Training and Education for Air Power	41
Air Power Functions	43
Conclusion	45
Notes	47

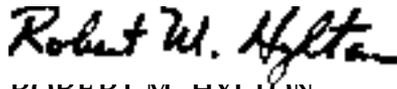
Foreword

In the fall of 1996, the Department of the Air Force published its vision for the twenty-first century Air Force. The vision, entitled *Global Engagement*, presented a new strategy to guide the Air Force in meeting the many challenges of the first quarter of the twenty-first century. It is a vision “of air and space power and covers all aspects of our Air Force—people, capabilities, and support structures.”¹ *Global Engagement* “is the first step in the Air Force’s back-to-the-present approach to long-range planning.”²

As the Air Force charts its course into the twenty-first century, valuable insight is gained by examining the beginnings of that course—the initial vector that has steered air power from its birth at the beginning of this century and will now carry air and space power into the next. The United States Air Force is inseparably linked to many aviation pioneers and air power advocates. The wisdom and vision of these early airmen have steered the development of air power throughout this century.

Among those early visionaries, Brig Gen William “Billy” Mitchell was perhaps the most outspoken advocate of air power and an independent air force. Mitchell was not only a pioneer in military aviation, but an air power visionary. He was among the earliest to realize the value of air power and to see not only the profound changes it brought to his times, but its vast potential for the future. His wisdom is as fresh and relevant today as it was at the beginning of the century when he offered it. This collection of Mitchell’s thoughts on air power offered here should illuminate the vision offered by *Global*

Engagement. Even though Mitchell set forth his thoughts nearly 80 years ago, the lineage can be seen between his vision and those principles that have guided our Air Force in the past, that guide our Air Force today, and that will guide the Air Force vision for the next century.

A handwritten signature in black ink that reads "Robert M. Hylton". The signature is written in a cursive, slightly slanted style.

ROBERT M. HYLTON
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About the Author

Lt Col Johnny R. Jones entered the Air Force in 1974 through the Reserve Officer Training Program. Assigned to the 50th Tactical Fighter Wing, Hahn Air Base, West Germany, he flew the F-4D and F-4E. Upon his selection to the German-US Exchange Officer Program, he flew the F-4F with the 35th Jagdbombgeschwader, Pferdsfeld Air Base, West Germany.

In operational assignments, he has served as an instructor weapon systems officer (WSO), standardization and evaluation flight examiner, functional check flight WSO, and chief of Weapons and Tactics. Assigned to Headquarters United States Air Forces Europe (USAFE), he served on the USAFE and European Operations (EUROPS) staff as a combat strike and employment officer.

As a distinguished graduate of the Air Command and Staff College, he was selected to the ACSC faculty. Lieutenant Colonel Jones commanded the 7362 Munitions Support Squadron, Volkel Air Base, the Netherlands. Upon returning to Headquarters USAFE as the chief of Doctrine and Joint Matters, he led theater-wide force restructuring and employment programs. He is currently serving as the chief of Doctrine Education in the Airpower Research Institute at the College of Aerospace Doctrine, Research, and Education (CADRE), Air University, Maxwell AFB, Alabama.

Preface

This is a book, not about William “Billy” Mitchell, but by Billy Mitchell—for printed here are his thoughts and ideas as collected from his writings and papers. Mitchell’s vision of aeronautics, aviation, and air power surpassed any other of his time. Less than a decade after the delivery of the first military airplane to the Signal Corps, and within a few years of the first aerial combat, Mitchell was speaking and writing of air power in terms that would take many decades to realize. His vision of the potential of air power was so complete that he saw beyond aerial flight and into space itself. Mitchell’s book *Skyways* published in 1930 contained the following dedication:

I dedicate this book to my two little children, Lucy Trumbull and William, Junior, who in their lifetime will see aeronautics become the greatest and principle means of national defense and rapid transportation all over the world, and possibly beyond our world into interstellar space.³

The words collected in this book were written and spoken by Mitchell between 1919 and 1930. The first successful powered flight by Orville Wright took place on 17 December 1903, and the first military aircraft was delivered to the Signal Corps in August 1909. Air power was in its infancy, and the observations of Mitchell are dated by his era. If the reader can put the words of Mitchell within the context of the time and weigh them against contemporary air power, the observations of Mitchell become even more remarkable, for they are as relevant now as they were at the beginning of the century.

Introduction

William “Billy” Mitchell was an aviation pioneer, an air power visionary theorist and prophet, and an outspoken proponent of air power. His abrasive and caustic character, coupled with his public criticisms of the army and naval services, however, made him not only a controversial figure, but cost him his military career. Many of Mitchell’s air power beliefs are disputed as not having been his, but borrowed from others such as Guilio Douhet, Hugh Trenchard, and Gianni Caproni.

Whatever the genesis of Mitchell’s thoughts, the fact remains that it was Mitchell himself that spoke and wrote passionately about the employment and potential of air power. Whatever the criticisms that surrounded him, it was Mitchell who openly fought for the independence of air power as a step toward realizing its potentials in national defense. Despite the controversies surrounding Billy Mitchell, he remains a prophet whose theories were launched in the combat of World War I, whose views were validated in World War II, and whose beliefs mirrored those that have formed the foundation of modern air power doctrine.

Despite any criticisms that may be levied against Mitchell, he remains the individual who can most be termed the founding father of the United States Air Force and American air power. Only now are airmen beginning to realize the wisdom of Mitchell’s words and fully understand the air power of which he spoke.

Born 29 December 1879 in Nice, France, Mitchell was raised in Milwaukee, Wisconsin. He attended Racine and Columbian (later known as George

Washington) Universities. He enlisted in the infantry in 1898 at the age of 18, was promptly promoted to lieutenant, and became the youngest officer to serve during the Spanish-American War. Serving in the Signal Corps he was assigned to the aviation section in 1915. Mitchell privately undertook, and completed, his training as a pilot at Newport News in 1916. In April of 1917, he was sent to Europe as a military aviation observer as America entered the war in Europe. On 22 April 1917, Mitchell was the first American flying officer to cross enemy lines. Mitchell was assigned to the American Expeditionary Force at the rank of lieutenant colonel in June 1917.

In May 1918 Mitchell was assigned to the First Army Corps in the rank of colonel and given command of the Air Service of the First Army Corps and later command of the Air Service of the First Army. Mitchell led his air forces in extraordinary air battles and combats throughout 1918, including the largest bombing mission ever assembled at that time, the nearly 1500-plane Allied bombing mission against the Saint-Mihiel salient in September 1918. Appointed a brigadier general and given command of the Air Service of the Group of Armies (combined air services) for the Meuse-Argonne offensive, he led bomber formations against targets behind enemy lines in October 1918.

Mitchell became the only high-ranking American officer that had led large air forces in combat. With the Armistice of 1918, Mitchell headed the Aviation of the Army of Occupation established in Germany.

Upon returning to the United States, Mitchell was assigned as the assistant chief of the Air Service in March 1919. In this position, Mitchell was charged with the training and operations of the Air Service. It was at this point that Mitchell fervently began his crusade for an independent air force and the unified control of military air power.

Mitchell's beliefs that air power had made the naval battleship obsolete enraged naval and civilian political leadership. At that time, a nation's military might could be measured by its battleships, so Mitchell's claims ran directly counter to prevailing beliefs, both among military leadership and civilian politicians. Although substantiating his claims by sinking the former German warship the *Ostfriesland* in 21 ½ minutes with aerial bombardment in July 1921, and later with successful tests off of the Cape Hatteras in September 1923, Mitchell's criticisms of the Navy and War Departments incensed his superiors, including President Calvin Coolidge.

Mitchell's criticisms of national military policy and especially national aeronautical policies and his unrelenting demands of his superiors to increase the size and improve the equipment of the Air Service led to his demotion in 1925. Mitchell returned to his permanent rank of colonel and was reassigned to San Antonio, Texas, in April 1925. There he commanded the VIII Corps Area. His fight for air power and an independent air force continued, however, despite admonishments by his superiors.

With the crash of the naval airship *Shenandoah* in September 1925, Mitchell spoke out publicly accusing the War and Navy Departments of "incompetency, criminal negligence, and almost treasonable administration of the National Defense."⁴ His pronouncement was viewed as an act of insubordination, and in December 1925 he was tried and convicted by an Army court-martial.

Mitchell resigned from the Army on 1 February 1926 and continued his fight for air power and an independent air force as a civilian. With unrelenting vigor, through numerous speaking tours, articles, and books, Mitchell unrelentingly spread his ideas of air power throughout the nation influencing both military and civilian listeners. Many of his views and

observations were proven during World War II, and his ultimate goal of an independent air force was realized in September 1947, over 11 years after Mitchell's death in New York City on 19 February 1936.

Within this book are collected the words of William "Billy" Mitchell. His writings were astonishingly prophetic and remain strikingly relevant to modern air power. Although his words are dated by the context of his time, when stripped of their period context and viewed in the light of contemporary air power, Mitchell's views are as fresh as the day they were proposed. The reader will note the heavy criticisms offered toward naval forces and is asked to reflect on these criticisms in light of Mitchell's disposition toward the battleship navy of his time. There are also many redundancies in Mitchell's words, but this is understandable given the battle Mitchell was engaged in to win the argument for air power. There is much a modern practitioner of air power can gain through the insights of Mitchell, because many of the truths that Mitchell offered remain a subject of debate today.

The Essence of Air Power

Mitchell realized and advocated air power as profoundly changing not only the manner in which wars would be fought, but the very ways nations of the globe would conduct their relations. Mitchell wrote: **“In the future, no nation can call itself great unless its air power is properly organized and provided for, because air power, both from a military and economic standpoint, will not only dominate the land but the sea as well.”**⁵

The value of Mitchell’s words are not diminished by new technologies and capabilities, for the essence of air power remains unchanged. The globe has become inexorably linked to air power, and air power has forever altered the manner in which conflicts are conducted.

- We have launched ourselves into what we call the air, a fluid that covers the whole earth like a deep blanket. Wherever this blanket extends, there we can go. As it covers the whole world, all places are accessible to the flyer.⁶
- Air power is the ability to do something in or through the air, and, as the air covers the whole world, aircraft are able to go anywhere on the planet.⁷
- The air is a common medium all over the world. It is bounded by no oceans, mountains, rivers or deserts.⁸
- The State has no air frontiers comparable to borders protected by deserts, coastlines, mountain ranges or deep rivers on the ground. The air permeates the whole world homogeneously, the only change being in its temperature and density.⁹
- The advent of air power has made every country and the world smaller. We do not measure distances by the unit of miles, but by the unit of hours.¹⁰
- Not only will every part of the world be reached but the world itself will be made correspondingly smaller

because distance will be measured in hours and not in miles.¹¹

- Air power has not only come to stay but is, and will be, a dominating factor in the world's development.¹²
- Air power not only has decisive military advantages, but most of it can be used in time of peace for some useful purpose.¹³
- No longer is the making of war gauged merely by land and naval forces. Both of these old, well understood factors in conducting war are affected by air power which operates over both of them.¹⁴
- No longer will the tedious and expensive process of wearing down the enemy's land forces by continuous attacks be resorted to.¹⁵
- Aerial siege may be laid against a country so as to prevent any communication with it, ingress or egress, on the surface of the water or even along railroads and roads.¹⁶
- Aircraft move hundreds of miles in an incredibly short space of time, so even if they are reported as coming into a country, across its frontiers, there is no telling where they are going to go to strike. Wherever an object can be seen from the air, aircraft are able to hit it with their guns, bombs, and other weapons. Not only is this the case on land, it is even more the case on the water, because on the water no object can be concealed unless it dives beneath the surface.¹⁷
- Air power, therefore, has to be employed as a major instrument of war, no matter whether a land or sea force is acting on the surface of the earth.¹⁸
- We should, therefore, investigate the nature of this new power which has come to us in the air, to see what advantages it has over the older arms on the ground and the water, in its principal use for national defense.¹⁹
- The airplane is one of the most complicated military instruments that has ever been used, and an Air Service, in reality, is harder to create and carry on than is any other arm, harder even than any army or navy.²⁰

- Air power is the great determining influence in the world's development, both as concerns national defense and economic development. An army's value today lies only in holding the ground, it cannot conquer it. A navy's value lies only in undersea operations, away from the attack of aircraft, because aircraft can destroy any kind of surface ship that has ever been built or that can be built. Air power, therefore, conquers the opposing state in war by paralyzing its nerve centers; the army occupies the ground so conquered; while the navy by submarines, attempts to destroy hostile commerce and acts as a means of supply for air forces operating from islands or possessions contiguous to the sea, which require transportation over and above what they can effect through the air.²¹
- The day has passed when armies on the ground or navies on the sea can be the arbiters of a nation's destiny in war. The main power of defense and the power of initiative against an enemy has passed to the air.²²
- Aviation is and will continue to be the principle arm of national defense.²³
- Nothing in the world's history has brought about as great a change in the employment of military power as the coming of the airplane.²⁴
- We need the airplanes for what was demonstrated time and time again in the European War, and only for one unit of each kind. If you do not authorize it, we shall lose all we learned in the war. It will have the same effect—except worse—of not allowing any rifles for a battalion of infantry, no cannon for a battery of artillery, and no horses for a troop of cavalry.²⁵
- Those of us in the air have had a vision of the future which we believe to be unquestionably correct.²⁶

Fundamental Truths of Air Power

Air power doctrine is a set of beliefs held by institutions about air power and the best way to employ it. Doctrine represents the lessons of experience and includes developing theories. For Mitchell there was little air power history beyond his personal experiences, and he noted that **“In aviation, particularly in its application and use, there is almost nothing to go on.”**²⁷

His ideas were largely theoretical, based on his experience and vision. His theories and those of his aeronautical contemporaries when validated would become air power doctrine. Mitchell's words reflect both fact gathered through experience, and theory springing from his insight and vision. Most of his early concepts on air power would be validated as fundamental truths and serve as the foundation of contemporary air power doctrine.

- To develop anything, the underlying thought and reason must govern, and then the organization must be built up to meet it.²⁸
- The attempt of one combatant, therefore, is to control the vital centers of the other that it will be powerless to defend itself. . . . From the dawn of history, nations have put numbers of men in the field, called armies, and have launched them at these hostile centers. The opposing nation then put a wall of men in front of these places to defend them, and a combat took place to determine which side would gain mastery. Gradually the theory grew up that the object of war was to destroy the hostile army in the field—because if this were done the country lay open to the invader. . . .

The advent of air power which can go straight to the vital centers and entirely neutralize or destroy them has put an entirely new complexion on the old system of making 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 stroke is made against the opposing centers, because a greatly superior army numerically is at the mercy of an air force inferior in numbers. . . . The result of warfare by air will be to bring about quick decisions.²⁹

- Air power can attack the vital centers of the opposing country directly, completely destroying and paralyzing them.³⁰
- In case of an air war the action will be directed against the vital centers, and the outcome will be determined in a comparatively short time. One side or the other will be completely victorious.³¹
- Heretofore, to reach the heart of a country and gain victory in war, the land armies always had to be defeated in the field and a long process of successive military advances made against it. . . . A new set of rules for the conduct of war will have to be devised and a whole new set of ideas of strategy will have to be learned by those charged with the conduct of war. No longer is making war gauged merely by land and naval forces. Both these old well-understood theaters of conducting war are affected by air power, which operates over both of them.³²
- Not only can a decisive stroke be made against a great industrial and commercial country by aircraft, but it can be held in subjection much more easily by an air force than by an army or navy.³³
- The art of war had departed. Attrition, or the gradual killing off of the enemy, was all the ground armies were capable of.³⁴
- What will this new element in warfare result in? Unquestionably the amelioration and bettering of conditions in war because it will bring about quick and lasting results.³⁵

- To bring war to a successful conclusion a sharp, quick decision is necessary, no matter what the losses, because it is much cheaper in every way to have the whole thing over quickly than to keep dragging it on for years. Today ground armies alone are not a means of obtaining a rapid victory in contests between first-class powers. They are becoming merely holding forces for ground areas.³⁶
- Speed of locomotion is the predominant characteristic of air power. . . . The range of view is almost infinite as compared with troops on the ground or a navy on the water. . . . Their routes through the air are straight lines—mountains, rivers, deserts and oceans are not obstacles.³⁷
- The air covers everything and wherever there is air, aircraft can go.³⁸
- No part of the country will be immune from attack to the nation having control of the air, as no frontiers exist for air forces, the air being the same the world over.³⁹
- The first battles of the future will be held in the air, and the results of these battles will either determine who shall win the war or have a very marked influence on it.⁴⁰
- In other words, the most important battle will be the first air battle.⁴¹
- The first decision in a war is going to be sought in the air.⁴²
- In future wars, aircraft will project the spear point of the nation's offensive and defensive power against the vital centers of the opposing country. Then woe be to the nation that is weak in the air. It will fall a prey to its enemy more quickly than has ever been the case in war waged by armies and navies.⁴³
- The only adequate defense against hostile aircraft is our own aircraft.⁴⁴
- As [the armed services] have changed so little in their methods and ways of conducting war for so many centuries, they always look back to find a precedent for

everything that is done. In the development of air power, one has to look ahead and not backward and figure out what is going to happen, not too much what has happened.⁴⁵

- With aviation, vision is a most important matter because its great possibilities lie ahead and not behind us.⁴⁶
- Air fighting is a thing distinct, and entirely in a class by itself.⁴⁷
- Air power has brought with it a new doctrine of war which has caused a complete rearrangement of the existing systems of national defense, and a new doctrine of peace which eventually will change the relations of nations with each other due to the universal application and rapidity of aerial transport.⁴⁸
- So many erroneous doctrines have been enunciated about aviation by the older services that see in the development of air power the curtailment of their ancient prerogatives, privileges, and authority, that we consider it time to challenge these proceedings and make our own views known.⁴⁹
- Those of us in the air knew that we had changed the methods of war and wanted to prove it to the satisfaction of everybody.⁵⁰
- The first thing to do, manifestly, was to conserve what we had learned in the European War, and we immediately set about writing all this down on paper so that it would not be completely lost.⁵¹
- All of the measures taken which are mentioned above [organization training and equipping] are at least written down and ready to be applied in case of trouble. They are, however, very largely theoretical.⁵²
- No missile-throwing weapons or any other devices have yet been created or thought of which can actually stop an air attack, so that the only defense against aircraft is other aircraft which will contest with them for supremacy of the air by air battles.⁵³

- There is one thing which was absolutely proved in the European war, and that is that nobody was capable of handling air units except flying officers who had learned by experience what flying was and how these things should be handled.⁵⁴
- The great trouble now is that, whenever an air question is up for discussion, mostly individuals who are not air officers are consulted. No one is capable of passing on air matters except an air officer trained in the work.⁵⁵
- No other military instrument has ever demonstrated, within such a short time, its absolute necessity, dependability, and power for carrying out military requirements.⁵⁶
- Probably [bombardment's] greatest value is in hitting an enemy's great nerve centers at the very beginning of the war so as to paralyze them to the greatest extent possible.⁵⁷
- Aviation depends for its action on a concentration of power at the decisive point.⁵⁸
- The divided control of the air force between the army and the navy resulted in a terrible mess.⁵⁹
- Aviation must attack to bring results. It cannot dig trenches or dugouts in the air and assume the defensive. It must go after its adversary, wherever he is, and either destroy him or be destroyed. There is no middle course.⁶⁰
- Putting an opponent on the defensive in the air is much more valuable comparatively than putting him on the defensive on the ground.⁶¹
- The premium of successful combat is shooting down the enemy and the forfeit when unsuccessful is to go hurtling to earth in a flaming coffin.⁶²
- We bombed the centers of concentration first to interrupt the communications through these centers, which was done to a great extent; and second, to make them defend that particular part of the line with their pursuit airplanes to keep them away from our lines. The

best criterion of the effect of bombardment against any place is the vigor with which they defend it.⁶³

- Military aviation is designed to inflict the greatest loss possible against the enemy and the dangers incident to this have to be sustained.⁶⁴
- The principal difference between the employment of our airplanes over the water and over the land is in the character of airdrome, or landing place, that has to be used. This landing place may be on the land itself; it may be on the water itself; it may be a floating airdrome on the water, such as an airplane carrier, or a floating landing platform.⁶⁵
- Most of the time the ground troops cannot see the air troops doing their work, as the air fights necessarily take place at a distance from the troops because the hostile air forces have to be sought out and fought wherever tactical requirements necessitate it. The ground troops consequently get the idea in many instances that they are abandoned by their aviation, and occasional glimpses of a mass of their own aviation such as mentioned above, crossing the lines, and, in spite of being covered by the hostile anti-aircraft artillery fire and attack of the hostile air forces, proceeding on their mission, is indeed a very inspiring sight.⁶⁶
- The air is a very large place. It has three dimensions—up, down, and sideways. Like any other military operations, concentration of force at the vital point is what counts. This often, and nearly always, is far removed from the troops on the ground, out of their sight, and out of their knowledge, and when the sharpest fighting is being carried on in the air, it is usually far within the enemy's territory, so as to carry the air fighting away from our own troops.

This often makes the troops on the ground, particularly green troops, feel that they are abandoned in the air. The way to prevent this feeling on their part is to instruct them as thoroughly as possible in how air

forces have to be used to obtain their maximum benefit. Not only should this instruction be given to the officers themselves, but to the non-commissioned officers and privates.⁶⁷

- If a soldier on the ground saw any hostile aircraft in the air, no matter how impotent it might be, he at once conceived the idea that everything he did was seen and immediately reported. . . . Aircraft really exerted an uncanny influence—on new troops particularly, and even on old ones—and quite rightly.⁶⁸
- Do not think that we are not on the job when you cannot see us—most of our planes work so far in front that they cannot be seen from the lines.⁶⁹
- All military progress has hinged on the development of armament (this is, bringing more fire to bear on the object to be attacked), on mobility or the power to go from one place to another quickly, and on the number of effectives or the strength that could be concentrated at the decisive point.⁷⁰
- It [air power] consequently has the power of offensive always with it, and can choose the time, place, and method of attack against either an army or a navy, and largely can control these matters for the army or navy with which it is acting, providing the hostile air force has been destroyed or put out of action.⁷¹
- Starting as a more or less insignificant adjunct to the armies in 1914, Aeronautics ended up on the Western Front as one of the decisive factors in all operations.⁷²
- The spring of 1917 had seen the real beginning of grand tactics in air warfare, that is, large numbers of airplanes acting together under a common leader.⁷³
- Whenever an attack of a military object depends on an explosive, an aerial bomb attack is the most efficient, because air projectiles carry a far greater proportion of explosives than any other missile (roughly, one-half their weight).⁷⁴
- To hit anything in the air, you have got to see it.⁷⁵

- Distance is nothing to airplanes. Our accuracy is the same up to the limit of our gas capacity.⁷⁶
- The air attack will come from whatever direction offers the greatest advantage to the attacker.⁷⁷
- The essence of air attack is to approach the objective from different directions so as to mislead the enemy, separate him into various detachments, maneuver him out of his position in the air, then combine one's forces at the crucial moment where they will do the most good.⁷⁸
- He [the air attacker] can use the greatest weapons of all time and can bring about decisions in warfare with a speed never conceived of before. Once the power of the initiative is seized by an air force, the opponent had better make peace.⁷⁹
- Putting an opponent on the defensive in the air is much more valuable comparatively than putting him on the defensive on the ground.⁸⁰
- Looking at the earth from aircraft gives us a different perspective from anything we have had before.⁸¹
- Fighting on the ground and on the water had gone on since the beginning of time, but fighting in the air had just started; and several generations will have to be born and pass away before people can adopt and maintain the same attitude toward this form of warfare as they exhibit toward the old familiar ones.⁸²
- Hindenburg looked back to Hannibal's Battle of Cannae, and made his disposition to fight the Russians at Tannenberg. Napoleon studied the campaigns of Alexander the Great and Ghenghis Kahn, the Mongol. The navies draw their inspiration from the Battle at Actium in the time of the Romans, and the sea fight of Trafalgar. In the development of air power, one has to look ahead and not backward, and figure out what is going to happen, not too much what has happened. That is why the older services have been psychologically unfit to develop this new arm to the fullest extent practicable with the methods and means at hand.⁸³

- It was the greatest concentration of air power that had ever taken place and the first time in history in which an air force, cooperating with an army, was to act according to a broad strategical plan which contemplated not only facilitating the advance of the ground troops but spreading fear and consternation into the enemy's lines of communication, his replacement system and the cities behind them which supplied our foe with the sinews of war.⁸⁴
- We were constantly forcing them to fight in the air; of course, it was a walkover on the ground for the army.⁸⁵
- In Mesopotamia, Irak, as it is called, the air force handles the military occupation of the country in a manner similar to that in which armies have in the past.⁸⁶
- Naturally, if ground is to be held, armies will still have to do it; but once a country has capitulated and agreed to certain terms, it can be controlled by threat of additional aerial bombardment, and ground forces can be transported under protection of air power.

It is probable that in a future war a very strong air power may so overawe its rival that it will not await the final shock but will capitulate before a strong demonstration of hostile air power.⁸⁷

- The first consideration in a modern war will be to seize and hold localities in which aircraft can act against the vital centers of the opposing nation. The question of who holds the sea is entirely secondary. It is a question of who holds the air.⁸⁸
- In the past war aircraft were grouped around the ground armies, for the most part at low altitudes, within plain sight, because at that time the armies were thought to be the principal means of obtaining a decision in war. Now, however, no more airplanes will be assigned to the ground armies than are absolutely necessary for their local wants. All the rest will be thrown into the offensive, hundreds of miles away.⁸⁹

- If an expedition is to take place, and it is desired to have the equipment quickly available, all parts of the airplanes, their motors, guns, ammunition, bombs, and everything necessary for them, should go over together at the same time, and be in the same place.⁹⁰
- We have two elements in an Air Service that have to work side by side—that is, the technical control of all equipment by the Engineering Section of the Air Force, and its tactical use by the fighting forces against the enemy.⁹¹
- A good supply system is always a very difficult element to have running smoothly at the beginning of a campaign, because during a time of peace all the methods and ways of doing things become so stabilized that when a change is brought about, unless very capable men are handling it, a great mix-up occurs.⁹²
- In applying Aeronautics to military purposes, it is necessary to hold in mind the principal mission of Aviation, deduce from that the tactics that must be employed to make this mission successful, and then from that trace the equipment that is necessary in order to make the tactical combinations possible.⁹³

The Aeronautical Era

Mitchell was among a few to see the tremendous promise of aviation and the potential offered by air power. Mitchell saw air power fundamentally changing the globe as it became a critical and vital element of national security and of a nation's economy. Mitchell's views have been validated over the decades as air power has become acknowledged as among the most critical elements of national power, because both a nation's economic and military power depend upon it.

It was not only the organization of the military component that Mitchell advocated, but also a national program of aeronautics that saw a nation's air power as the total of its civilian and military aviation. With the airplane, Mitchell saw the peoples of the earth entering into a new era, the aeronautical era.

- The world stands on the threshold of the "aeronautical era." During this epoch the destinies of all people will be controlled through the air. Our ancestors passed through the "continental era" when they consolidated their power on land and developed their means of communication and intercourse over the land or close to it on the seacoast. Then came the "era of the great navigators," and the competition for the great sea lanes of power, commerce, and communication, which were hitched up and harnessed to the land powers created in the continental era. Now the competition will be for possession of the unhampered right to traverse and control the vast, the most important, and the farthest reaching element of the earth, the air, the atmosphere that surrounds us all, that we breathe, live by, and which permeates everything.⁹⁴

- Every airplane that a nation owns, whether commercial, civil or military, is a great asset, as they can all be used in an emergency.⁹⁵
- Military Aeronautics may be said to have begun with the War in Europe on August first, 1914.⁹⁶
- Aeronautics is a new and developing art. We must not prepare for what happened yesterday, but what is going to happen tomorrow, and the day after. Let us not forget the lessons of the past with respect to aeronautics, and again place ourselves in an absolutely defenseless position before the other nations of the world.⁹⁷
- If one thinks how long it took to develop steam and electricity, one is struck by the rapid development which has accompanied airplane evolution since the beginning of the War.⁹⁸
- Each year we learn more about it [flying], we go faster, higher and for greater distances without landing.⁹⁹
- Aviation at the present time can operate in practically any weather and under all conditions, except those of very heavy fog. Even this now is being attacked and a solution appears probable in the future.¹⁰⁰
- Those who develop aviation, or anything new for that matter, must not be bound by traditions of the past.¹⁰¹
- The average dweller on the earth never knows that above him aircraft in the United States are speeding between the Atlantic and Pacific, and from the northern frontier to the southern frontier, on regular scheduled trips.¹⁰²
- In fact, there is not one department of the Government which cannot utilize in some way the activity of aircraft.¹⁰³
- The whole aeronautical development, military, civil and commercial, is inseparably involved in one organization.¹⁰⁴
- The substantial and continual development of air power should be based on a sound commercial aviation.¹⁰⁵
- The development of aviation, however, since the first flights of the Wright Brothers at Ft. Myers, Va., to the

present, has been much more rapid and practical than in the time required for a corresponding development of steam engines and electricity, automobiles, the telephone and telegraph, or wireless telegraphy.¹⁰⁶

- The development of aeronautics is infinite. . . . It is increasingly evident that the future national defense, future predominance in commerce, and the future economical development of a country lie in the air.¹⁰⁷
- In fact all aircraft developments, the factories that make them, the airways that are established for civil aviation and the civilian pilots and crews, are distinct military assets, and can bring in a return in time of peace, thereby reducing the national expenditure necessary in their maintenance if they were kept solely and exclusively for war.¹⁰⁸
- A system of airways would more greatly help civilian aviation than any other one thing; in fact, without it civil aviation cannot be developed because it is too expensive for any one individual, company, or corporation to establish and maintain airdromes all through the country.¹⁰⁹
- In the development of national aeronautics, commercial aviation is almost as great an asset as if it were regularly incorporated into fighting units.¹¹⁰
- In England, before the establishment of their department of the air, [air] regulation was turned over to the British Board of Trade and it is said that one of the first regulations they made was that when two airplanes met each other in the fog they should blow their fog horns! There were other rules almost as ludicrous as this, because the work was being done by men untrained in air matters.¹¹¹
- The terrible conditions in our national aeronautics today is not so much the result of the absolute ignorance of individuals, because often these are selected on the principle of saying 'tag, you're it; go play with aviation,' when they know nothing about it and are really more to be pitied than blamed. The trouble is with

the system, and we flying people insist that our views be known and weighed by the American public.¹¹²

- What we want to lead up to is this. Aviation must be ready when the war starts, because that is when aviation will be called on. Airplanes do not last forever and develop rapidly. Relative strength in the air depends on what the other fellow has.¹¹³
- A system of airdromes and airways through the country is almost as necessary in the application of an air force as is a system of gasoline and oil stations, with all their accompaniments of roads and telegraph and telephone lines for the automobilist, or a similar organization for the railroads.¹¹⁴

Air Power and the Air Force

Mitchell clearly saw the need to organize the nation's air power to promote its development and effective use. Mitchell wrote: **“The first thing that the United States should do is to establish a Department of Aeronautics specially charged with the development of all matters relating to the air.”**¹¹⁵

Mitchell was a zealous proponent of air power as a separate and distinct military component, a United States Air Force. Through the employment of integrated air power, under the command of airmen skilled and knowledgeable in air power, Mitchell believed air power could most effectively realize its capabilities.

- To what, then, is the true development of a modern system of national defense to lead in the future? It is to establish the air force as the first line of defense of the country. Actually it is now, whether recognized as such or not.¹¹⁶
- While we need every branch of national defense to form the complete chain. We must not lose sight of the fact that our aviation at present is the weakest link in our chain, that we are the one country which can maintain and support an aviation more easily than any other, and that it is more important for our national defense that we maintain a large air force than is the case with any other nation.¹¹⁷
- Worse than anything else, the naval air forces are tied up to the navy on the water and the army air forces are tied up to the army on the land—neither is made to think that its main mission is in the air and that it must keep itself free from encumbrances on land or sea.¹¹⁸
- Our air force, however, by attacking their transportation trains, railroads and columns on the roads, piled them up with debris so that it was impossible for many of

their troops to get away quickly, resulting in their capture by our infantry.¹¹⁹

- And, if it is not done in time of peace, it will be all over when war is declared because the air force will be the first to attack.¹²⁰
- [The] branches of aviation are just as distinct as artillery is from infantry is from cavalry.¹²¹
- The three branches of Aviation constitute the offensive power of an air force. They all work together, and are interdependent.¹²²
- All branches of aviation depend on each other to a greater or less extent in order that they may be able to carry out their functions in the air.¹²³
- When operations are projected, all the air forces must be instructed in what these are to be. This information is contained in what is known as the aeronautical plan of employment. It is drawn up by the commander of the air forces, submitted to the commanding general of the whole forces, and is published in the form of orders by the headquarters. It is the most important document dealing with the air operations, and its thorough understanding by all the air forces is essential to an efficient performance of their duties.¹²⁴
- I read them the orders myself and asked each one individually what he could do to comply with them.¹²⁵
- I always kept an officer at my headquarters, whose name I shall not mention, whom I had read all the orders. If he could understand them, anybody could. He was not particularly bright but he was one of the most valuable officers I had.¹²⁶
- All military development, no matter what its nature, has depended on three things, improvement of armament, that is, better rifles, guns and cannon, greater mobility, that is speed of movement, communications, roads, railways; and last numbers of effective units at the decisive point. An air force has two of these three elements developed to a very high degree, that is

mobility and power of concentration. The armament is being improved constantly.¹²⁷

- A united Air Force would provide an aeronautical striking force designed to obtain control of the air and demolish whatever hostile land or water targets might be necessary, according to the military situation.¹²⁸
- Heretofore, to reach the heart of a country to gain victory in war, the land armies always had to be defeated in the field and a long process of successive military advances made against it. . . . Now an attack from an air force using explosive bombs and gas may cause the complete evacuation and cessation of industry in these places. This would deprive armies, air forces, and navies even, of their means of maintenance.¹²⁹
- A modern organization of a country's military power, therefore, indicates that aircraft will be used over both land and sea for combating hostile air forces, demolishing ships on the sea and important targets on the land.¹³⁰
- Eventually, all military power of the Government should be concentrated under a single department which would have control over all national defense, no matter whether it be on land, on the sea, or in the air.¹³¹
- The first element to enter into combat with the enemy will be the air force.¹³²
- Suitable and adequate preparation of the air arm, and of the personnel required to man the aircraft, manufacture the equipment, and supply such a force, cannot be furnished by the Army or Navy, or by the two combined, as has been the experience in all countries in the recent War. . . . Neither the Army nor the Navy, nor both combined can be expected to develop, organize and perfect a flying corps, and its employment, to the greatest possible limit of which that weapon is capable.¹³³
- The air force had become as specialized in its own work in the air as the armies were on land and the navies on the water. Pursuit, Attack, and Bombardment aviation

were just as different as Cavalry, Infantry, and Artillery.¹³⁴

- The size of the air force that may be employed is unlimited, because it has the whole air in which to operate, as distinguished from roads or railroads on the ground, or even an ocean, with its limitations of a single dimension, distance and coastlines. Compared to armies, an air force is not tied down by roads. It can move to any place entirely unhindered . . . speed, power of vision, and maneuverability. . . .

From its speed alone an air force has the power of taking the offensive against either a navy or an army, and engaging these forces under its own conditions. Providing an air force has gained control of the air, it can completely conceal its own movement, or the movement of an army on the ground or a navy on the water, by preventing hostile reconnaissance. . . .

Consequently, the only defense against an air force is another air force, and as an indispensable prelude to any engagement, whether it be on the water or on the land, there must be an air battle to determine which side shall control this area above the earth and the water.¹³⁵

- There is no defense against an air force except an air force.¹³⁶
- Have the necessary air forces always ready at the outbreak of war, because this is the first of our arms that will enter into combat and it is upon a favorable air decision that the whole fate of a war may depend.¹³⁷
- Once an air force has been destroyed it is almost impossible to build it up after hostilities commence.¹³⁸
- One kind of airplane or air organization can no more perform all the duties required of an air force than can Artillery, Cavalry or Infantry acting alone form a whole army.¹³⁹
- If you do not allow us to equip our aviation with American material, you are merely putting our first line of our national defense—that is, the air force—in the

hands of foreign nations that some day may be our enemies.¹⁴⁰

- The whole thing should be known as the Air Force, and the personnel should be assigned either to an active or reserve status.

The active air force should carry out its peacetime military instruction in combination with the Army and Navy, and also in maneuvers to bring out its own special work.

The reserve air force should be organized definitely into squadrons, groups, brigades and higher units, right alongside of the active air force units permanently in the service.

Our first division then of the Department of Aeronautics will be an Air Force, with the unusual staffs required for such an organization—that is, an Administration Section, . . . Training and Operations Section, . . . Equipment Section, . . . Medical Section, . . . [and a] Legal Section.

Besides the Air Force there should be two main divisions under the Department of Aeronautics—the Supply Division and the Division of Civil Aeronautics.¹⁴¹

- There are a great many points of difference between the management of an air force and that of an army or navy. An air force operates in a new medium, the air, which offers a wider scope for action than either land or water.¹⁴²
- The same conservatism in the development of new methods of war is what has wrecked many nations before and what has made every war we have had dangerous to our well-being, and very expensive.¹⁴³
- If you scatter the air force all around, it leads to double overhead, to a double system of command, and to many other difficulties. It has been proved wrong everywhere.¹⁴⁴
- Every pilot, every ship, and every airdrome are distinct assets as a part of the national defense.¹⁴⁵

- I want it to be distinctly understood that I do not consider that the air force is to be considered as in any sense supplanting the Army. You have always got to come to manpower as the ultimate thing, but we do believe that the air force will control all the communications, and that it will have a very great effect on the land troops, and a decisive one against a navy.¹⁴⁶
- To begin with, when any operation is contemplated by the superior command, the reason for the operation, the objectives to be attained, and the general system which will be followed are prescribed. The Air Service then prepares its plan of employment, which is a statement containing an estimate of the situation with respect to the enemy's position, his ground troops, and any special features bearing particularly on the aeronautical situation.¹⁴⁷
- Weather is a most important consideration for the flying man whether he be in an airplane, airship, or an ordinary balloon.¹⁴⁸
- Airplanes have to start from and come back to a flying field, therefore the organization and handling of fields is a very important matter.¹⁴⁹
- The best way to ensure safety in the air is to estimate what may go wrong and make adequate provision against it.¹⁵⁰

Air Power and Control of the Air

From his combat experiences in World War I, Mitchell realized the need to control the air. He saw that control of the air was not simply a task to be achieved at some point, but a prerequisite to all other military action. **“No navies can operate on the seas, nor armies on the land, until the air forces have first attained a decision against the opposing air forces, so as to allow those on the water to operate against their enemy. Therefore, as a prelude to any engagement of military or naval forces, a contest must take place for control of the air. The first battles of any future war will be air battles. The nation winning them is practically certain to win the whole war, because the victorious air service will be able to operate and increase without hindrance.”**¹⁵¹

- Our aviation doctrine should be find out where the hostile air force is, and to destroy it as rapidly as possible.¹⁵²
- Once supremacy of the air has been established, airplanes can fly over a hostile country at will.¹⁵³
- Their anti-aircraft defense from the ground was excellent and well co-ordinated with their air force, but this, of course, is merely an auxiliary of the air force itself. It acts as their sentinel and is a means of signaling to the airplanes by the projectiles shot out by the guns, in addition to its positive value of fire attack against aircraft. It has not decisive effect on air battle.¹⁵⁴
- The proper application of air power adds tremendously, not only to the offensive ability of a force, but if the air is held, a very weak ground force can retreat with ease before a very much superior enemy.¹⁵⁵
- Pursuit aviation . . . is the kind designed to take and hold the offensive in the air against all hostile

aircraft, . . . it is with this branch of Aviation that air supremacy is sought and obtained.¹⁵⁶

- Pursuit squadrons are essentially an offensive element, and to enact their role successfully, they must take and maintain the offensive. They should seek the enemy and wherever found, attack and destroy him.¹⁵⁷
- The first problem over the water, therefore, as it is over the land, is to assure command of the air by Pursuit Aviation.¹⁵⁸
- A large lumbering airplane or collection of airplanes, no matter how well armed, cannot resist the surrounding attack of Pursuit Aviation.¹⁵⁹
- The tactics of Pursuit Aviation may be likened very much to those of Cavalry in the mounted attack in the old days. The elements to be utilized to the greatest extent are surprise, boldness of action and an attack in echelon, that is, successive formations designed to envelop and surround the enemy with a fire attack. This branch of aviation calls for more dash, more quickness of thought, and instant appreciation of tactical situations in the air, than any other military arms.¹⁶⁰
- All other branches of military aeronautics are helpless without an adequate, strong, well-trained and well-equipped Pursuit Aviation. . . . No one understands the necessity for this kind of aviation as the airmen themselves do.¹⁶¹
- If the troops think that enemy planes can get through the lines and shoot their own balloons down—they are usually from three to five miles behind the line—they become imbued with the idea that the enemy is controlling the air entirely, and that everything they do is seen and reported.¹⁶²
- Future control of the seas depends on the control of the air. This is so to an even greater extent than is the case on land, because on the sea, the shipping—using the surface of the water—cannot conceal itself to the same extent that man or his equipment can be concealed on land.¹⁶³

- Should a nation, therefore attain complete control of the air, it could more easily master the earth than has ever been the case in the past.¹⁶⁴
- For fighting against aircraft all means of defense against aircraft should be attached to the Air Force.¹⁶⁵
- The principal mission of Aeronautics is to destroy the aeronautical force of the enemy, and, after this, to attack his formations, both tactical and strategical, on the ground or on the water. The secondary employment of Aeronautics pertains to their use as an auxiliary to troops on the ground for enhancing their effect against hostile troops.¹⁶⁶
- The primary mission, therefore, of our air service is to seek out, attack, and destroy the air service of its enemy. It is essentially an offensive arm in its tactical application, and all air services should be organized with that end in view from a strategical standpoint. With a proper organization an air service can be brought to bear against an enemy with much more rapidity than any other arm.¹⁶⁷
- The moment that airplane attacked airplane, the principal mission of the air force was to whip the hostile air force, so as to enable the airplanes to observe, to drop bombs, or attack troops. . . . Today, the principal mission of an air force is to destroy the hostile air service, just as the mission of an army is to destroy the hostile army.¹⁶⁸
- We should first get control of the air, and then work directly in combination with whatever is on land or on the water to further the main object of the campaign.¹⁶⁹
- The pursuit ship is the most essential always because you cannot control the air without the pursuit ships.¹⁷⁰
- These bombardment raids have to be protected by Pursuit Aviation, and the plan of employment prescribes the general method by which this will be done.¹⁷¹

Airmen in Air Power

Mitchell saw air power as uniquely distinct from any form of military combat that had yet been devised. He felt that air power was more distinct from land and sea power than the two were from each other. Because of this, airmen were uniquely distinct from soldiers and sailors.

“The air-going people actually form a separate class. They are more different from landmen than are landmen from seamen.”¹⁷² In this same way, Mitchell believed that only airmen should be charged with commanding airmen and air forces.

- Already, we have an entirely new class of people that we may call “the air-going people” as distinguished from the “land-going people” and the “sea-going people.” The air-going people have a spirit, language, and customs of their own.¹⁷³
- There is a basic difference in the nature of combat indulged in by an air force as distinguished from an army or navy. In the army, the infantry soldier is the basis of the organization. Everything else is built up on him. . . . With the air force, the soldier or enlisted man is a highly trained mechanic, having a knowledge of shop methods and machine tools, armament, weapons, optical instruments and photography and all sorts of engines and materials. . . . The pilots and observers who constitute the officer personnel are the ones who do the fighting, much as the knights did in the Middle Ages, attended by their men-at-arms, squires, grooms and lackeys. The result of this condition is a very close personal association between the flying officers and enlisted men under them.¹⁷⁴
- Not only does an air force know what each branch of aviation is doing in the air when acting with an army or with a navy, but it has to keep in constant touch with everything that is taking place on the ground or the

water. The airman, therefore, not only from his position of advantage in the sky looks down on the whole field of battle and surveys the contests between hostile air forces in the clouds, but he knows the particular mission which every distinct part of the force, whether on the ground or in the air, has had assigned to it. He knows a great deal about the general operations and mission of the whole force, so that he can act independently on it in case of necessity. Many times the good judgment of a lieutenant pilot has changed the whole aspect of an air and ground battle.¹⁷⁵

- An air officer was selected because his training gives him an insight into the land and sea operations, which no other service can possess.¹⁷⁶
- The man who does the fighting in the air force is a very high order of human being. Whereas the attack is made by units larger than the individual plane, in the last analysis of a combat, it is the individual plane that closes with his adversary and fights him, either by the fire action of his guns or bombs and gas screens, or possibly, now that we have parachutes, by ramming. There is no one very close to support and talk to him or give him assistance, as there is with ground troops in the army. He is absolutely on his own.¹⁷⁷
- Few people outside the air fraternity itself know or understand the dangers that these men face, the lives that they lead and how they actually act when in the air, how they find their way across the continent with unerring exactness—over mountains, forests, rivers and deserts; what they actually do in improving the science and art of flying and how they feel when engaged in combat with enemy aircraft. No one can explain these except the airmen themselves. The number of those who have experience and who are capable of expressing themselves, is rapidly growing fewer. Every opportunity should be taken by those that remain to enlighten their fellows on this subject.¹⁷⁸

- The airmen have gained their knowledge by actual experience, not by being members of an old well-established service that has gone on in the same rut of existence for decades. . . . With us air people, the future of our nation is indissolubly bound up in the development of air power.¹⁷⁹
- The greatest of all our assets, however, were the wonderful pilots and air officers which this country had created.¹⁸⁰
- The pilots of these planes, from vantage points on high, see more of the country, know more about it, and appreciate more what the country means to them than any other class of persons.¹⁸¹
- Bold spirits that before wanted to “go down to the sea in ships,” now want to go “up in the air in planes.”¹⁸²
- The work of the air force depends on the men that fly the planes, not primarily on those that remain on the ground.¹⁸³
- The individual airman, therefore, bears more responsibility and requires a higher tactical and strategical training than any other individual in the military service.¹⁸⁴
- No one can know the air except one who works and travels in it, and a thorough air education can only be acquired by long study and experience in this science and art. The greatest handicap under which aeronautics has labored in all countries and particularly in the United States, has been the fact that the Government agencies charged with the development of aviation have, in practically every case, been organized with a non-flying direction at their head, which could not possibly know or appreciate the problems concerned in its development.¹⁸⁵
- Technical ability is an exact science, and can be learned very largely in schools and colleges. The duties of an air force lie in the air, and it is there that all the personnel concerned with its handling must receive the maximum amount of training.¹⁸⁶

- So many new elements came into the training of fliers that a whole new system of education has been developed for them.¹⁸⁷
- In addition to the tactical requirements, all supply officers, technical officers, medical officers, or anybody concerned with the Air Service should have sufficient flying education to enable them to appreciate the problem in hand.¹⁸⁸
- Ninety per cent of the effectiveness of an Air Service depends on the morale and initiative of its personnel.¹⁸⁹
- There is no place in any service in which individual responsibility has to be exercised to the extent that it does by the airman.¹⁹⁰
- It was amply proved in the European War that officers trained in army methods on the ground could handle Infantry, Cavalry, Artillery, or other troops, or all of them in combination, but it was proved more strongly that they could not in any way handle air troops until given a thorough aeronautical education. To put flying troops in the hands of officers not trained in their use is to throw them away.¹⁹¹
- The actual pilots who are engaged in the handling of the airplanes, therefore, must be the final judges of whether the equipment is any good for the object that is to be attacked or not.¹⁹²
- There is a greater community of feeling among people who go in the air than is the case in any other calling.¹⁹³
- The military flyer must move at tremendous speed through the air. Not only must he fly his own airplane, but must see all the other airplanes around him, friendly as well as hostile ones; he must observe the ground, be ready to attack or defend himself at any instant, be ready to land on any sort of surface, mountains, forests, plowed ground. He may have to fly for hundreds or thousands of miles to his destination and there deliver his cargo or bombs, or report what he sees, or make his attack either against hostile air forces,

vessels on the sea or vital centers. It is a supreme test of character and courage.¹⁹⁴

- The men are the all important things. It is very necessary to keep up your supply of skilled pilots in connection with aeronautical operations.¹⁹⁵
- Not every officer was capable of becoming an airplane pilot, very few in fact. Beside such physical and mental characteristics as alertness, splendid eyesight, initiative, endurance, they must have a natural aptitude for the air.¹⁹⁶
- Safety of the pilot and the airplane which he flies is very largely due to the excellence and mechanical ability of the enlisted men. To get good men in time of peace requires competition with existing trades in civil life. In the Air Service, we have to have some seventy-five trades. There is no surer way to ruin an Air Service than by making it impossible for it to maintain and keep efficient enlisted men.¹⁹⁷
- The officers who entered the Air Service and are making a career of it are those who have the initiative to go into the most dangerous branch of the Service, whose losses in time of peace are commensurate with those in other branches in time of war, who are building up this Service in spite of the difficulties to be overcome, and who, for that reason, have the maximum amount of initiative and are not given the rank in proportion to the commands which they now have.¹⁹⁸
- The Air Service, more than anything else, depends for its efficiency on a well instructed personnel, bold in the carrying out of its air duties, and with initiative sufficient to develop this newest of arms.¹⁹⁹
- With an army on the ground, a person is shoulder to shoulder with another. If he is wounded, he can lie down on the ground and be aided by his comrades. If he is on the sea, he is in a ship close to his companions. When in the air, however, he is away from these, off by himself thousands of feet up. If he is not successful, he goes down in flames.²⁰⁰

WILLIAM "BILLY" MITCHELL'S AIR POWER

- The old discipline, as conceived and carried out by armies and navies throughout the centuries, consists in the unhesitating obedience by a subordinate to the orders of his superior. . . . With the aviator, however, the keenest, best educated, most advanced type of man has to be selected. These are some of the reasons why an officer raised in an army or navy atmosphere is totally incapable of understanding an airplane pilot's mentality or the way to handle or develop him.²⁰¹
- My mind was made up more than ever to rely on the judgement of the doctors as to a man's fitness for flight. Our doctors proved their value more and more every day.²⁰²
- The more I saw of the way non-flying officers were conducting our Air Service, the surer I was of many rocks ahead.²⁰³
- The thing we most greatly lacked was superior commanders for our larger air units. There were practically no officers of the regular army who were competent. None of them had had any experience in war and with very few exceptions, none of them were good enough pilots.²⁰⁴

Air Power and Armies and Navies

Mitchell foresaw the fundamental changes that air power held for the conduct of warfare. Within this he also saw the ways that air power would forever alter the manner in which land and sea forces would conduct operations. Mitchell expressed this as: **“The relations of armies to navies and navies to armies are now very different from what they were, while both bear an entirely new relation to air power from that which they formerly bore each other. Even if hostile armies and navies come into contact with each other, they are helpless now unless they can obtain and hold military supremacy in the air.”**²⁰⁵

- The conceptions we have always had that wars must be waged by armies and navies must be revised.²⁰⁶
- A navy cannot work on land; an army cannot work on the water; an air service can work over both.²⁰⁷
- An army fights on land, a navy on the water, but an air force over both.²⁰⁸
- Just as the navy always thinks first of the battleships and makes aviation secondary to that, the army thinks of the infantry and makes aviation a secondary matter.²⁰⁹
- Neither armies nor navies can exist unless the air is controlled over them. Air forces, on the other hand, are the only independent fighting units of the day, because neither armies nor navies can ascend and fight twenty thousand feet above the earth’s surface.²¹⁰
- As long as it was a question of land and sea power, that is, armies and navies, the matter was well understood because they had been continued and applied for centuries. The variation in their use has been very small and has consisted almost entirely in improving the instruments and equipment but not methods.²¹¹

- The action of armies and navies on one plane or dimension—that is, on the surface of the ground or the surface of the water—is slow in execution as compared to operations in the air.²¹²
- This condition is due to the blind opposition of the Army and Navy Bureaucracies that have abrogated to themselves the policy of standing squarely in the way of progress, and constantly advocating the theories of the bow and arrow men of a barbarous age.²¹³
- An air force attack, . . . is as an aid to an army and does away with no specific arm, just as a navy may assist in a landing.²¹⁴
- Two basic contentions have always been advanced by armies and navies concerning aircraft. These are that antiaircraft weapons are a positive defense against aircraft and that battleships cannot be destroyed by aircraft. Both are absolutely and positively fallacious.²¹⁵
- In order to apportion the money for national defense properly, we should make an accurate estimate of all of the capabilities of each branch of the service, that is, what the Army can do, what the Navy can do, and what the Air Service can do.²¹⁶

Air Power and Armies

Mitchell wrote that: **“The role of armies and their way of making war will remain much the same in the future as it has in the past, if air power does not entirely prevent them from operating.”**²¹⁷

- The armies themselves, their operations, their strategy, and even their tactics are little different from what they were in the days of the Romans.²¹⁸
- In this war the ground troops seldom met their adversary face to face. . . . War on the ground resolved itself into an attack of masses that employed missile-throwing weapons to keep the adversary as far off as possible.²¹⁹

- Of course, everything begins and ends on the ground. A person cannot permanently live out on the sea nor can a person live up in the air, so that any decision in war is based on what takes place ultimately on the ground.²²⁰
- It was practically impossible to impress the men in the ranks, through their own officers, as to the value of aviation. . . . Wherever possible, we took the infantry battalions back of the line to our airdromes and took the noncommissioned officers and other soldiers up in the air. This impressed them with the necessity of cooperating with the airmen as much as possible, as they transmitted it on to the privates.²²¹
- The army, in its conception of the use of armed forces, has been in a state of arrested development for many centuries. Its theory embraces the use of physical power of one man against another, aided by weapons which he can carry in his hand or transport close to him, whose action depends on the range of visibility, or what might be termed 'eye shot,' for their use. The dogma of the man raised in the army school is that armies must be brought together to determine a war. This theory is now obsolete and to tie an air force to an army means the virtual extinction of its efficiency and the proper theory of its operation.²²²
- Armies will be used on land for insuring domestic tranquility, holding operating bases for aircraft and seacraft and, in a last analysis, together with air power against hostile armies.²²³
- We could see the utter helplessness of the armies on the ground. They were merely thousands of men led to the shambles, as the result of a faulty system which was entirely oblivious to the meaning of modern war.²²⁴
- Bit by bit the army was losing its mobility and, therefore, becoming incapable of obtaining a decision over the enemy.²²⁵
- Enthusiastic tank officers think that in their arm of the service they have a branch that will revolutionize land warfare. . . . These tank officers are strong believers in

aircraft also and think great results could be obtained, with comparatively little loss of life, from its use in conjunction with tanks, the aircraft striking at the enemy's rear areas, while the tanks make a direct attack on the front.²²⁶

- The advent of the airplane to warfare has given the commander of a great army a strategical reserve which was never dreamed of before the advent of this wonderful instrument.²²⁷
- You will never eliminate the land forces entirely from the air, but you will greatly affect them.²²⁸

Air Power and Navies

In Mitchell's era the strength of a nation was often measured by its battleships. Nations had grown to global power based on their naval might; however, Mitchell felt that air power and the aeronautical era had forever changed this situation.

He believed that surface navies were obsolete as they had no defense against air power. Consequently Mitchell wrote extensively and quite critically against naval forces. Praising the submarine, Mitchell condemned surface forces, especially for coastal defense that he felt could better be conducted by air power. He concluded that **“naval vessels will not be able to play the part they have in past wars, unless completely protected by aircraft.”**²²⁹

- Eventually, you will find that, dollar for dollar spent, you will get more from an air force than from submarines, as an air force will both protect sea communications and destroy hostile vessels.²³⁰
- From a military standpoint the airmen have to study the effect that air power has on navies and what their future will be. They know that within the radius of air power's activities it can completely destroy any surface vessel or warships.²³¹

- A Navy should be organized and equipped to take the offensive on the high seas, and not be employed along and close to the coast. Such Air Forces should be assigned to the navy as can go to ask [sic] with it and fight with it on the high seas.²³²
- Air Force, with the types of aircraft now in existence or in development, acting from shore bases, can find and destroy all classes of seacraft under war conditions, with a negligible loss to the aircraft.²³³
- Seacraft are much more vulnerable when they have steam up in their boilers, are moving at a high speed in formation, and when they are equipped with ammunition in their magazines and on their decks.²³⁴
- The problem of the destruction of seacraft by Air Force has been solved, and is finished. Our recent maneuvers show that an enemy having control of the air—which gives him control of the sea—may land air forces from airplane carriers on any of the Islands or Keys along our coasts, which cannot be attacked by troops or artillery and from these points launch air attacks against our great centers of population in the triangle Bangor-Norfolk-Chicago.²³⁵
- Hostile navies are no menace to our country if there is adequate air power.²³⁶
- The characteristics of air power, in comparison with sea power, are, first, the predominant feature of speed which air power possesses.²³⁷
- From its speed alone the air force has the power of taking the offensive against the Navy and engaging it under its own conditions. The only defense against an air force is another air force; and, as an indispensable prelude to any engagement on the water, there must be an air battle to determine which side shall control the area above the water which is to be used by a fleet.²³⁸
- Up to recently, military aviation over the water has been thought of by the ordinary person essentially in connection with navies.²³⁹

WILLIAM "BILLY" MITCHELL'S AIR POWER

- It should be noted that the whole development for the use of aircraft over the water is not in air tactics, in types of airplanes particularly, or in the securing and training of air personnel; but is essentially a development of floating airdromes.²⁴⁰
- It is the belief of the majority of Air Operations in all Services that the development of the Air Service will mean the extinction of navies on the surface of the ocean in the future.²⁴¹

Training and Education for Air Power

Realizing the unique nature of air power and its potential, Mitchell also realized that airmen could not be trained or educated within the traditional land or naval systems. Mitchell wrote: **“We therefore need an entirely different system of training, education, reserves, and replacements, from that of the other services.”**²⁴²

- Many people think that the training of flyers is a very easy thing. This is more difficult, probably, than that in any other branch of the service.²⁴³
- The education of the highest type of airman embraces more subjects and more thorough knowledge of world conditions than has been required of one person or profession.²⁴⁴
- As the training of the air personnel in flying and mechanics is common to every use—whether it be with the Army, the Navy, or any other department of the Government—the primary aeronautical schools should be the same.²⁴⁵
- Certain of those who have shown themselves most proficient are selected for training at the Field Officers’ School, where the use of all branches of aviation in combination is taught, including the solution of air problems, plans of employment, operations, reconnaissance, bombardment, and the various branches of work in the Air Staff Departments—that is, operations, information, equipment, lighter-than-air, and administration.²⁴⁶
- When the young men [in attack aviation] have completed their courses in the special schools, they join their squadrons or actual air troops. After serving there for a period of two years and becoming entirely familiar with the tactics, supply, and handling of their organization, certain of those who have shown themselves the most proficient are selected for higher

tactical education, and some for higher technical education. Those for a higher tactical education are sent to the Air Service School at Langley Field on Chesapeake Bay. . . . Those chosen for a technical education are sent first to the School of the Engineering Division of the Air Service, which at present is at Dayton, Ohio.

There [at the Air Service School] they are taught how to handle the air arms in combination, how to work with the ground troops, how to fight other air troops, navies, and ground troops—in other words, it is here that officers are given their education which combines all the different elements of aviation.²⁴⁷

- In America, where our pilots had been trained under non-flying officers who knew nothing about aviation, acrobatics and maneuvers in the air had been frowned upon as being dangerous. The result was that pilots became afraid to fly as they should, and when they got into a dangerous place and had to maneuver, they were incapable of doing so, and disaster ensued.²⁴⁸

Air Power Functions

As a pioneer of military aviation, Mitchell saw firsthand the growth of aviation and the beginnings of its tremendous potential. Used first as an observation platform for land forces, then as a means of aiming artillery, aviation quickly achieved success as a combat force unto itself through air superiority, attack, and bombardment.

The many functions of air power, however, were given but a brief preview before World War I ended. Mitchell writes: **“The European War was only the kindergarten of aviation. It had machines that were just invented, the possibilities of their use were just beginning to be understood by the aviators themselves, while others looked on them as strange creations that were defying all known laws of science, of custom and of war. . . . Without a doubt [aviation] would have had the utmost influence in settling the war had [the war] lasted another year.”**²⁴⁹

- The mission of Observation Aviation is to find out and report to the commanding officer of the troops to which it is attached what is in front of him, and in his vicinity.²⁵⁰
- [Observation aviation] is the best known and the one which is concerned more with the troops on the ground than any other.²⁵¹
- The next duty of Observation Aviation deals with the adjustment of fire of artillery or other missile-throwing weapons.²⁵²
- Another distinct branch of Observation Aviation is what is called Surveillance. These are the airplanes that remain over hostile positions—or off a coast-line for instance—and report back by wireless what they see.²⁵³
- They formed elevated and fixed platforms from which observation could be continued both by day and night if necessary, and, as they were in constant communication

with the ground through their telephone centrals, they could be connected with the organizations of troops, both of the Artillery, Infantry and Headquarters.²⁵⁴

- In fact, the principle of all observation is that, whenever a place can be seen by a terrestrial or ground observer, a balloon is not used; what can be seen from a balloon is not handled by an airplane, and the things that the ground observers and the balloons cannot see are assigned to the airplanes.²⁵⁵
- On account of the speed of airplanes and the fact that they must occasionally land on the surface of the ground to replenish their fuel, ammunition and personnel, it is necessary first that very efficient means of communication be provided so that these air forces can be properly guided for the work that they are required to do.²⁵⁶
- Day Bombardment, in addition to demolishing objects, had the effect of forcing the enemy to defend with his air forces the areas attacked, and no better indication could be found of its efficiency than the great resistance which the enemy would offer to the Day Bombardment Aviation.²⁵⁷
- The basis of air force power is the bombardment airplane or bomber.²⁵⁸
- Its specific mission is to attack troops, trains of automobiles, convoys, railroad trains, tanks, debarkations from trains, ships or vessels, warships, or any military object on the ground or the water which exposes itself to attack from the air by cannon, machine guns, or light-weight bombs. Attack Aviation works at low altitudes.²⁵⁹
- The idea of having an armored plane to attack troops on the ground was a pretty good one.²⁶⁰
- Attack Aviation is designed for the direct attack, with cannon, machine guns, and grenades, of hostile troops on the ground, tanks, anti-aircraft formations of all sorts, hostile airdromes, motor trains, railroad trains, or anything of that nature.²⁶¹
- The attack airplanes have to work in the closest harmony with their own Pursuit Aviation.²⁶²

Conclusion

It must be the policy of every Government to guarantee to its people a reasonable degree of security, prosperity and happiness.

The basis on which such a policy must be built is constitutional national government and its application to conditions that confront the Nation.

These conditions never remain entirely the same for long periods. They change from time to time.

National Defense is an important adjunct of national policy which is called into use when other means of adjusting international disputes have failed.

It is one concrete proposition for the whole country. It is not a monopoly exercised by any class, section or division of the people.

Air Forces, Armies and Navies are merely agencies of the people to carry out their will where national physical defense is required.

In a war between two first-class industrial nations, modern scientific developments have increased the defensive power of Armies on the ground to such an extent that one Army cannot advance or break through another Army. Consequently, Armies have become merely holding forces or caretakers of occupied territory.

In international war, surface Navies are practically useless. The Submarine is now the main instrument of maritime warfare.

Air Power has taken its place as the dominant instrument in international war. It can fly straight through the air to the vital centers of the opposing state, destroy them and render the country losing control of the air in a defenseless state.²⁶³

Notes

1. United States Air Force, *Global Engagement: A Vision for the 21st Century Air Force* (Washington, D.C.: Department of the Air Force, 1996). Cover letter signed by Chief of Staff Gen Ronald R. Fogleman and Secretary of the Air Force Sheila E. Widnall. Within this vision, the core competencies of the Air Force were introduced as: rapid global mobility, precision engagement, global attack, air and space superiority, information superiority, and agile combat support.

2. *Ibid.*, 1.

3. William Mitchell, *Skyways A Book on Modern Aeronautics* (Philadelphia, Pa.: J.B. Lippincott Co., 1930), 5. *Skyways* was Mitchell's final book and published a few years before his death. Although he refers to interstellar space, he never wrote about this aspect of air power (space power). His writings did contain many futuristic air power concepts (such as aerial torpedoes guided by gyroscopes—similar to what would become cruise missiles), but these were not examined in great detail in his writings.

4. "Col. Mitchell's Statements on Govt. Aviation," *Aviation* 19, no. 11 (14 September 1925): 318. The editor's note reads: "So that those who did not read the complete statements made by Col. William Mitchell may have them available, they are reprinted. They represent the most daring indictment of the War and Navy departments ever made by an officer. Many of the assertions are certain to be challenged. They will undoubtedly from [sic] the basis of a new Congressional inquiry." Mitchell's statement begins:

I have been asked from all parts of the country to give my opinion about the reasons for the frightful aeronautical accidents and loss of life, equipment and treasure that has occurred during the last few days. This statement therefore is given out publicly by me after mature deliberation and after sufficient time has elapsed since the terrible accidents to our naval aircraft, to find out something about what happened. About what happened, my opinion is as follows: These accidents are the direct result of the incompetency, criminal negligence and almost treasonable administration of the national defense by the Navy and the War Departments. In their attempts to keep down the development of aviation into an independent department,

separate from the Army and Navy and handled by aeronautical experts, and to maintain the existing systems, they have gone to the utmost lengths to carry their point. All aviation policies, schemes and systems are dictated by the non-flying officers of the Army or Navy, who know practically nothing about it. The lives of the airmen are being used merely as pawns in their hands.

5. William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power— Economic and Military* (1925; reprint, New York: Dover Publications, Inc., 1988), x. Mitchell was dismayed to see the aviation experience gained by the United States during World War I being left to languish while other nations such as Britain and France were making tremendous strides in aviation, both in equipment and organization. Mitchell advocated not only military aviation, but national aviation. He wrote: "The time has come when aviation must be developed for aviation's sake and not as an auxiliary to other existing branches. Unless the progressive elements that enter into our makeup are availed of, we will fall behind in the world's development."

6. *Skyways*, 17. This chapter is devoted to explaining and examining flight, from gliders to helicopters to airships.

7. *Winged Defense*, 3-4. The chapter title of these pages is "The Aeronautical Era." As Mitchell writes: "The world stands on the threshold of the 'aeronautical era.' During this epoch the destinies of all people will be controlled through the air." This chapter was originally published as an article, "Aeronautical Era," *The Saturday Evening Post*, 20 December 1924.

8. William Mitchell, *Our Air Force: The Keystone of National Defense* (New York: E. P. Dutton & Co., 1921), xix. The earliest of Mitchell's books, it provides an examination of air power and Mitchell's early ideas on its organization. Mitchell writes on page xvii: "The purpose of this book is to bring before the American people an idea of what an efficient organization of our aeronautical resources means to the country, how it can be brought about, and what we already have for doing it."

9. *Ibid.*, 13.

10. *Winged Defense*, 26. Mitchell writes on pages 25-26: "If a nation ambitious for universal conquest gets off to a 'flying start' in a war of the future, it may be able to control the whole world more easily than a nation has controlled a continent in the past. The advent of air power has made every country and the world smaller. We do not measure distances by the unit of miles, but

by the unit of hours. . . . Should a nation, therefore attain complete control of the air, it could more nearly master the earth than has ever been the case in the past.”

11. *Ibid.*, 95. This quote comes from the chapter titled “Civil and Commercial Aviation.” The paragraph reads: “An all-land airway can be established to South America and take passengers from New York to the Argentine Republic in from fifty to sixty hours and also a practically all-land route from New York to Peking, China, by way of Canada, Alaska, and Siberia, in from sixty to seventy hours. . . . Not only will every part of the world be reached but the world itself will be made correspondingly smaller because distance will be measured in hours and not in miles. The substantial and continual development of air power should be based on a sound commercial aviation. America is in a better position to develop commercial aeronautics than any other nation in the world.”

12. *Ibid.*, 119. This quote is from the chapter titled: “How Should We Organize?” This material also appeared in “How Should We Organize Our National Air Power?,” *The Saturday Evening Post*, 14 March 1925. Mitchell relates how the major powers of the world have or are developing aviation to a much greater degree than the United States. He writes that France “has developed the greatest air force in the world. She has a separate department of aviation,” but that arrangement is “not as good as England’s organization” where there is “strong agitation for an air ministry to control all air matters.” He continues by relating that “Italy is organizing a separate department of aeronautics similar to that of England. Germany had a separate air service in 1916. Denmark is abandoning her army and navy and relies for protection on her air force and police. Sweden has an air ministry and is concentrating her power on the development of the air. Japan is diving into the aviation pool as deeply as possible. She still has an inefficient organization but is consolidating her aviation activities more and more. Russia is developing her air power and has a single department of national defense. America still hesitates to consolidate her aeronautical activities.” Mitchell felt the development of air power depended on the manner in which a nation organized its national aeronautics, and that for aviation to progress it required national attention and the consolidation of aeronautics into a single department. Mitchell’s concerns over the slow progress of American aeronautics concerned not only military aviation, but the nation’s air power. He writes: “Those interested in the future of the country, not only from a national

defense standpoint but from a civil, commercial and economic one as well, should study this matter [referring to the manner in which other countries are developing aeronautics as compared to that of the United States] carefully, because air power has not only come to stay but is, and will be, a dominating factor in the world's development."

13. Ibid., xiv. This statement again demonstrated Mitchell's concern with the national aspects of aviation, not only that of military aviation. Mitchell wrote of the many uses of aviation throughout the country from aerial survey to crop dusting and other peacetime uses. This material appeared in "Civil and Commercial Aviation," *The Saturday Evening Post*, 7 February 1925.

14. Ibid., 6. Mitchell writes: "A new set of rules for the conduct of war will have to be devised and a whole new set of ideas of strategy learned by those charged with the conduct of war." This material first appeared in print in "Aeronautical Era," 3.

15. Ibid., xv-xvi. Having witnessed the carnage of World War I trench warfare first hand, Mitchell saw the tremendous potential of aviation to bypass the fielded armies and strike directly at the adversary's vital centers.

16. Ibid., 5. This material first appeared in "Aeronautical Era."

17. Ibid., 4. Mitchell wrote that "aircraft are able to go anywhere on the planet. They are not dependent on the water as a means of sustentation, nor on the land, to keep them up. Mountains, deserts, oceans, rivers, and forests offer no obstacles."

18. Ibid., 102. This material appeared in "How Should We Organize Our National Air Power." Mitchell writes on pages 101-02:

The airman looks at the development of a country's military effort somewhat as follows. National defense consists roughly of four phases: First, the maintenance of domestic tranquillity in the country itself so that the preparation of active fighting material can go on unhindered. An army on the ground to insure tranquillity and an air force in the air to prevent hostile air raids can take care of this. Second, the protection of the coasts and frontiers. An air force can do this and fight any hostile aircraft or destroy hostile warships while its home country is policed and protected on the ground by a land force. Third, the control of sea

communications. This can be done by aircraft within their radius of action and otherwise by submarines. Surface craft have a secondary value for this. Fourth, the prosecution of offensive war across or beyond the seas. This may be carried out primarily under the protection of air power, assisted by submarines and an army. A succession of land bases held by land troops must be occupied and the enemy must be attacked directly through the air. Floating bases or aircraft carriers cannot compete with aircraft operating from land bases. So that, in future, surface transports escorted by war vessels such as carried the American troops to Europe cannot exist in the face of a superior air force. Only when complete dominion of the air has been established can a war of invasion across the seas be prosecuted under present conditions.

19. Our Air Force, 11. Mitchell writes: "So far, aviation is essentially a military instrument of government. It has not arrived at the point where it can with economy support itself in the commercial field. That this is coming, there can be no doubt, and coming quickly. That it is an indispensable part of the national defense, without adequate provision for which a nation cannot succeed in either a defensive or offensive war, is unquestioned."

20. *Ibid.*, 131. Mitchell explains on pages 131–32:

The Engineering Section of the Air Service obtains the characteristics of the airplanes from the operating force, and causes models to be made for each kind of test. . . . After the Technical Section is told to get out a design, it takes four to five months at least to construct the first types. It takes two or three months to test them and make the necessary changes, a month or so to give the orders out for their construction, and about a year to complete any number of them. So that, actually, it takes as long to complete an airplane as it does to produce proper flying officers to handle them. It takes several years to develop any one type of motor satisfactorily.

21. William Mitchell, *Memoirs of World War I: From Start to Finish of Our Greatest War* (New York: Random House, 1928), 5. Mitchell quantifies his ideas by writing: "If the total value of national-defense elements be placed at one hundred, air power is worth as much as both army and navy combined; air power is worth fifty, an army thirty and a navy twenty."

22. *Memoirs*, 291. Mitchell writes: "We Americans had developed the best system for air fighting that the world had ever seen. We had entered into full combat with the splendid air troops that the Germans had trained for over three years of war before we joined. We not only held our own but greatly excelled in it. We could look with absolute confidence to the future if our system were maintained and our men trained in actual combat were given charge of the development to make America absolutely safe from hostile invasion." Writing of the ratio of enemy aircraft shot down by American aircraft, to American aircraft shot down by enemy aircraft, Mitchell notes on page 292: "My figure showed that from the time American air units entered into combat (March 1918) to the 11th of November 1918, our men shot down and received official confirmation for 927 enemy airplanes or balloons, and during the same time we lost, due to operations of the enemy, 316 of our airplanes or balloons. This ratio of three to one was remarkable and much greater in proportion than the victories achieved by any of our Allies."

23. *Skyways*, 309. Mitchell concludes his book *Skyways* with this quote and continues: "So great is the military advantage accruing to a strong air power that it might easily achieve world dominion. All parts of the world can be communicated with instantly by radio or wire. Aviation has not only reduced the size of the world to one-sixth its former dimensions, but has effaced all natural barriers to transportation. Every part of it, no matter whether over land or sea, desert or arctic waste, is accessible by aircraft."

24. *Ibid.*, 253. Mitchell continues: "War is the attempt of one nation to impress its will on another nation by force after all other means of arriving at an adjustment of a dispute have failed. The attempt of one combatant, therefore, is to control the vital centers of the other that it will be powerless to defend itself."

25. "Statement Regarding the Necessity of the Air Service," 4 January 1921, Maxwell AFB, Ala., USAF Historical Research Agency, document 167.404-9, 19. Here Mitchell, as assistant chief of the Air Service, provides testimony to a congressional committee on the necessity of an Air Service. In this line of questioning, Mitchell tries to influence a decision allowing aircraft to demonstrate their capability against battleships. The line of questioning (on pages 18-19) proceeds by a Mr. Slemp who states: "It seems to me the principle problem is to demonstrate the certainty of your conclusions [referring to the ability of aircraft to destroy surface warships]." Mitchell

responds: "Give us the warships to attack and come and watch." Mr. Slemp: "How much money would you need for demonstration purposes?" Mitchell: "We need no money to demonstrate the proposition; all we want are the targets and to have you watch it." Mr. Slemp: "That involves the supposition that your conclusions are correct. You are building an air force around your conclusions, and are asking for \$17,000,000." Mitchell: "That is not based entirely on my conclusions. It is the best practice in the world for the employment of an air force. The \$17,000,000 asked for is for the existing Army Air Service authorized by law." Mr. Slemp: "How are you going to demonstrate your proposition is right, and that if it is correct, that that is the course to be pursued? You will save millions of dollars if you can demonstrate it. How much money do you want for that purpose? How many vessels do you need for these experimental purposes?" Mitchell: "We need nothing for demonstration which we have not at present. We need \$17,000,000 to equip the units now existing with modern and safe airplanes. Those we have on hand now are obsolete, old and becoming unsafe. We have got to have tactical units in the air to be able to fight, just as you have to have a battalion of infantry. We only ask for one unit of each class of aviation. If you do not see fit to grant it, remember that what we have learned during the war will be lost very largely because it will not be kept up." Mr. Slemp: "Suppose you demonstrate that with the vessels you now have; then you do not need any more vessels?" Mitchell responds with the quote given in the body of this work.

26. *Memoirs*, 6. Mitchell continues: "We do not wish to see our country rendered helpless. Now is the time for us to weigh carefully the evidence of the last war and prepare for any contests that may come in the future."

27. *Winged Defense*, 27. Less than 16 years after the first airplane delivery to the Signal Corps (August 1909), Mitchell is at the birth of military aviation. He writes: "In the old and well established branches of learning there is something to go on that has been developed before, that one can model on and study. In aviation, particularly in its application and use, there is almost nothing to go on. The air man has to 'learn' himself, for the most part." This chapter of *Winged Defense* is titled "Leadership in Aeronautics Goes To The United States." This chapter was originally published as the article "American Leadership in Aeronautics," *The Saturday Evening Post*, 10 January 1925, 18.

28. "Aeronautical Era," 103. Mitchell is referring to the doctrine of the air forces of the United States as he goes on to

write: "The doctrine of aviation of all these great countries is that they have sufficient air power to protect themselves in case they are threatened with war. Each one solves the matter in a way particularly adapted to its own needs."

29. *Skyways*, 253-56. In *Memoirs*, page 4, Mitchell also makes this point. "So it was supposed heretofore that in order to obtain victory, this hostile army had to be destroyed, so as to open the avenue to the vital centers. In times past, when the only avenue of approach was over the land, the axiom that the objective of war was the destruction of the hostile army in the field was sound."

30. *Memoirs*, 4. Mitchell goes on: "Very little of a great nation's strength has to be expended in conducting air operations. A few men and comparatively few dollars can be used for bringing about the most terrific effect ever known against opposing vital centers." "Awake America," *Aero Digest* 9, no. 1 (July 1926), 7, Mitchell wrote: "Air power has taken its place as the dominant instrument in international war. It can fly straight through the air to the vital centers of the opposing state, destroy them and render the country losing control of the air in a defenseless state." Also, refer to the "Conclusion" of this book for a more complete presentation of the *Aero Digest* article.

31. "When the Air Raiders Come," *Collier's* 77, no. 18 (1 May 1926): 8. Mitchell continues on page 9: "A war on the ground will therefore become nothing but an orgy of killing, continuing over a period of years and ending in utter exhaustion. It will decide nothing."

32. "Aeronautical Era," 3.

33. *Skyways*, 256.

34. *Memoirs*, 10. Mitchell goes on to write (referring to the opposing armies of World War I): "The high command of neither army could bring about a decision, and the alarming conviction was beginning to dawn on the world that it must just stand by and witness European civilization being destroyed and ruined for many years, if not for all time. Air operations, however, in contrast to ground activities, were constantly increasing in importance and effectiveness, and it was quite apparent to me that if the war lasted until 1919 or 1920, air power would be a deciding element." He went on to note on page 15: "It seemed to me that the utility of ground armies was rapidly falling to about zero, due to the great defensive power of modern firearms."

35. "Aeronautical Era," 99. Mitchell continues this statement with: "It will require much less expense as compared with that of the great naval and land forces which have heretofore been the

rule, and it will cause a whole people to take an increasing interest as to whether a country should go to war or not, because they are all exposed to attack by aircraft, no matter if they live in the remotest interior of all the country.”

36. “Look Out Below,” *Collier's* 81, no. 16 (21 April 1928): 8. Based on his experiences in World War I, Mitchell explains: “The opposing armies indulged in an orgy of killing that not only decimated the forces of every country involved, but used up all their resources, their raw materials, manufacturing plants and means of communication. That sort of war, pushed to its logical conclusion, would result in the utter ruin of all that were parties to it. There would be no swift and sure decision by any one nation, no matter what the cost in lives and treasure.”

37. *Our Air Force*, 12. In the chapter titled “Characteristics of Air Power,” Mitchell writes on pages 12–13:

Speed of locomotion is the predominate characteristic of air power. Armies on the ground move about two and a half miles an hour by marching, and about twenty miles an hour on railroad trains. A column of troops on one road, twelve to fifteen miles long (which is the depth of an ordinary tactical division of infantry troops), requires about six hours to deploy on a front, that is, to prepare to fight. Navies move at a maximum rate of about twenty miles an hour, and increase this speed about thirty percent when going into action. Airplanes move in large bodies at the rate of one hundred miles an hour or over. They fight at speeds around one hundred and fifty miles an hour, while the fastest ones are approaching two hundred-mile rate. The range of view is almost infinite compared with troops on the ground or a navy on the water. At a height of fifteen thousand feet, a radius of view of fifty miles is possible; in other words, a circle whose diameter is one hundred miles, and one can see much further if the weather is clear. The time of development for battle by airplanes, that is, getting from traveling formations into their fighting formations, is negligible. . . . Their routes through the air are straight lines—mountains, rivers, deserts and oceans are not obstacles.

38. “General Mitchell’s Parting Address,” *National Aeronautic Association Review* 3, no. 6 (June 1925): 84. Mitchell says: “By ‘national defense’ is meant the keeping of our country inviolate from hostile military elements along our coasts, along our

frontiers, and all over our interior. The whole country now is a frontier, as the air covers everything and wherever there is air, aircraft can go."

39. Our Air Force, 221. In the chapter "A Glance Into The Future," Mitchell writes on pages 220-21:

In case an offensive war is necessary, the air organizations will fly across the water to their destinations, and be supplied by airships without any recourse to communications on the ground or on the water. They will be able to force a landing in a hostile country through their own power, protect it and transport enough personnel there to defend the position, and maintain their own aircraft. No part of the country will be immune from attack to the nation having control of the air, as no frontiers exist for air forces, the air being the same all over the world. The cost of maintaining a force of this kind, as compared to a navy or an army, will be very much less; and the number of men that will have to be removed from useful commercial pursuits will amount to very little—even with the greatest air force which we can conceive at the present time, not one-twentieth as many would be necessary as for an army, and less than one-fourth of what would be necessary for a large navy.

40. Our Air Force, 200. In the chapter "What the United States Should Do Now to Establish Its Aeronautical Position," Mitchell writes: "First, we must take into consideration the military aspects of aeronautics, and constitute a real air force, which can be mobilized with rapidity at the outbreak of a war. The first battles of the future will be held in the air, and the results of these battles will either determine who shall win the war or have a very marked influence on it. Consequently, speed of mobilization is the first requisite.

41. William Mitchell, "Our Army's Air Service," September 1920, Maxwell AFB, Ala., USAF Historical Research Agency, document 248.211-61P, 12. Mitchell wrote this staff paper when he was chief of Training and Operations, United States Air Service. "In case of any operation involving defense of the coast (which presupposes the elimination of our navy), an offensive war on foreign soil, or any operation involving an army, the first element to enter into combat with the enemy will be the air force. If an initial advantage is gained by the enemy, it is a question whether the air force or the country will ever recover from it. In

other words, the most important battle will be the first air battle.”

42. *Our Air Force*, 128. In the chapter on “Flying Personnel,” Mitchell writes: “Another thing which has been conclusively proven is that if a nation is not ready with its flying officers at the beginning of a war, it will never be ready during it, due to the length of time that it takes to train flying officers. The first decision in a war is going to be sought in the air. If this is unfavorable, the nation probably never will recover from it during the existence of the contest. Also, see endnote 41.

43. *Skyways*, 269–70.

44. “General Mitchell’s Parting Address,” 84. Mitchell often made this point in his writing and speaking. “We know positively, of course, that missile-throwing weapons acting from the ground cannot defend the country against hostile aircraft. To place any basic reliance on them alone is merely a delusion and a snare. Like any auxiliary, a certain amount of them is necessary in their proper place. The only adequate defense against hostile aircraft is our own aircraft.”

45. *Winged Defense*, 20–21. Mitchell writes:

The armed services of a nation are the most conservative elements in its whole makeup. To begin with, they antedate the governments themselves, because all governments have been brought into being by great popular upheavals which have found expression in military forces. The traditions among all the armed services are much older than any government, more conservative than any department of government, and more sure to build on a foundation that they are certain of rather than to take any chances of making a mistake. As they have changed so little in their methods and ways of conducting war for so many centuries, they always look back to find a precedent for everything that is done. In the development of air power, one has to look ahead and not backward and figure out what is going to happen, not too much what has happened.

46. *Winged Defense*, 97. In the chapter “How Should We Organize Our National Air Power? Make It A Main Force Or Still An Appendage?,” Mitchell argues for America to have the vision of “progressing in its aeronautical organization and consolidating its air activities under one responsible head” rather than “going on with its effort split up between other services that have a major function apart from aeronautics.”

47. *Our Air Force*, 34. Mitchell goes on to write: "It bears very little analogy to fighting on the ground or on the water, except for the principles of strategy, and some elements of grand tactics, are applied."

48. *Winged Defense*, vii-viii.

49. *Ibid.*, viii. Mitchell adds on page ix:

Aeronautics is such a new and rapidly developing science in the world that those concerned in it have not the age, rank or authority which, in the eyes of the older services, entitles them to speak. Most of the data that Congress gets on the subject of aviation comes from officers or agents who are not actual aeronautical officers who have not come up through the mill of aeronautical experience, both in war and in peace. The airmen have gained their knowledge by actual experience, not by being members of an old well-established service that has gone on in the same rut of existence for decades.

50. *Ibid.*, 71.

51. "Our Army's Air Service," 3. In this section of the staff paper (pages 3-4), Mitchell addresses "Reduced to a Peace Footing."

The duty of working out a plan for the future development of aviation was intrusted to those of us who remained in the Air Service, which after the armistice was reduced to a total of 1,348 officers (of whom 85 percent had to be flyers, and among whom no vacancies could be filled if for any reason officers were lost to the service by casualty, resignation, or otherwise), and 11,000 enlisted men. The first thing to do, manifestly, was to conserve what we had learned in the European War, and we immediately set about writing all this down on paper so that it would not be completely lost. It must be remembered that nothing existed to act as a model, as is the case in the infantry, cavalry, and field artillery, which have their organization, drill regulations, methods of operation, and traditions. All of our fighting tactics, methods of operation, organization, traditions, and cohesion had been evolved and developed on the European battlefields. These things were unknown and almost unheard of in the United States, because our effort had been directed toward producing flyers and machines to feed in to the squadrons fighting in Europe. These manuals by which the air units should operate, and

systems, were completed by the summer of 1919, and have been constantly improved since.

52. *Ibid.*, 9–10.

53. “Aeronautical Era,” 4. Mitchell goes on to write: “Great contests for the control of the air will be the rule in the future. Once supremacy of the air has been established, airplanes can fly over hostile country at will.”

54. Our Army’s Air Service, 8–9. Mitchell adds: “These officers were more difficult to get than those for any other branch of service, largely because aviation was so new and comparatively little understood. So we adopted a system of education for our air personnel which involved the selection of young men suitable from a mental, moral, and physical standpoint.”

55. “Statement Regarding the Necessity of the Air Service,” 24. The line of questioning on pages 23–24 is by Mr. Anthony and concerns the preparation of an air force in time of peace. Mr. Anthony asks: “Has not a board recently appointed for the purpose found that it was impracticable to prepare this country for war in time of peace, and that it was more practicable after the declaration of war to develop the air program?” Mitchell responds: “There was a board which recommended an air program of 3,800 planes and 24 airships to be prepared in time of peace.” Mr. Anthony: “What board was it that made the finding I just mentioned?” Mitchell: “I do not know what board that was.” Mr. Anthony: “Was the board you refer to a joint Army and Navy Board?” Mitchell: “No, sir. It was an Army board, of experienced Army officers, that recommended the organization of the Army.” Mr. Anthony: “Did it not decide that it was not practicable to prepare for war in the air in time of peace?” Mitchell: “No, sir, that board did not do that; quite the contrary—it decided that it was and should be done at once.” Mr. Anthony: “Did it not decide that it was not practicable to put the country on a war basis in time of peace, so far as the air was concerned?” Mitchell: “No, sir.” Mr. Anthony: “There was such a board that made such a finding.” Mitchell: “I have not seen that report; I do not know of it. But, if such a report was made, their conclusion is wrong, because it can be done in time of peace with a small expenditure of money. And, if it is not done in time of peace, it will be all over when war is declared because the air force will be the first to attack. The great trouble now is that, whenever an air question is up for discussion, mostly individuals who are not air officers are consulted. No one is capable of passing on air matters except an air officer trained in the work.”

56. *Our Air Force*, 1-2. "Before the great War, Aviation had been regarded more as a science than as a force which constituted an element of power to a State, equal in importance to armies and navies. Its efficacy was questioned by the great majority of the older professional soldiers, and it struggled against prejudice, ignorance, and incompetency in its development. In spite of all these handicaps, however, within four and one-half years, it has stood out as an arm by itself, supreme in its own power in the air, and bidding defiance to armies on the ground and navies on the water."

57. "Air Service Tactical Application of Military Aeronautics," 5 January 1919, Maxwell AFB, Ala., USAF Historical Research Agency, document 167.4-1, 3. In this staff paper, Mitchell discusses the "principle divisions of aviation" as pursuit, bombardment, and observation. Here he is referring to bombardment aviation: "This is organized for the purpose of attacking enemy concentration points of all sorts at a distance from their front lines. Probably its greatest value is in hitting an enemy's great nerve centers at the very beginning of the war so as to paralyze them to the greatest extent possible. In the theater of operations of an army, it is used against supply points of all sorts, airdromes, railroad stations, roads and communications, and, last against troops and trains on the roads."

58. *Our Air Force*, 32. Mitchell goes on to write: "Isolated action of any one class of airplanes, or of a few flights of squadrons of planes, is incapable of influencing a decision against a modern air force. An air force has the advantage of being able to bring fire to bear in three dimensions: from above, from underneath, and on the same level; and from any direction—that is, from in front, on the flank, and in reverse or behind."

59. *Memoirs*, 132. Here Mitchell is referring to the early division of the British air forces between the army and navy. He writes: "The navy, which was responsible for defending the air over the water, did not know the Germans were coming and consequently had dispatched no planes to meet them. The army, not having been notified of their coming, had no planes at the coast to fight them off. When the German planes started home, the army planes pursued them as far as the water, but no navy planes were there to take up the chase."

60. *Skyways*, 235. Mitchell makes the same statement in *Memoirs*, page 240: "Air forces cannot dig holes in the air and get into them where the enemy will not see them, and where they may sit in safety and comfort."

61. "Aeronautical Era," 4. Mitchell further writes: "Armies may dig trenches, live in them, or sit around in them waiting for an enemy to attack them. This cannot be done in the air."

62. *Memoirs*, 240. This statement is related to that of the preceding endnote.

63. "Statement Regarding the Necessity of the Air Service," 22.

64. *Winged Defense*, 87. In this part of the chapter, "Civil and Commercial Aviation," Mitchell is discussing the differences between the two regarding accidents and safety. "In military aviation there will always be a certain number of accidents because military service has to have the fastest pursuit ships, the greatest weight carriers for bombers, and the maximum performances of all sorts which cut down the factors of safety. . . . In commercial aviation, however, every measure is taken for the safety of the passengers and crews so that already very great safety has been attained and the future promises to hold out still more."

65. *Our Air Force*, 162.

66. *Ibid.*, 59–60. Mitchell begins by writing: "In addition to the material and personal damage that these air bombardment attacks have on an enemy, the moral effect on one's own troops is tremendous." Also, see endnotes 67 and 68.

67. "Air Service Tactical Applications of Military Aeronautics," 10. This was a common observation of Mitchell's concerning ground officers. Mitchell also writes of this as he experienced it in conversations with the French General de Gallais in *Memoirs*, page 45: "The comment of the General, that the men liked to see their airplanes over them, was a usual one with ground officers. They did not seem to recognize the fact that planes had to go far into the enemy territory to engage hostile planes on their own side, and prevent them from crossing and attacking our observation planes."

68. *Memoirs*, 251. Mitchell writes that once seeing an enemy aircraft, the troops felt: "as a result the enemy could direct his artillery fire against the reserves that were coming up from behind to help him . . . and quite rightly, because many of these things were true."

69. *Ibid.*, 262. Mitchell had Colonel Dodd prepare a message (pages 262–63) that was dropped to the infantry on the ground entitled: "FROM THE AMERICAN SCRAPPERS IN THE AIR TO THE AMERICAN SCRAPPERS ON THE GROUND," to encourage cooperation between the infantry and air forces. The message contained many explanations of the value of air power to the ground forces. The message was signed: "YOUR AVIATOR."

70. "Our Army's Air Service," 11. This material begins the staff paper section titled "Could Aviation Become Our Second Line of Defense?" Mitchell discusses armament, mobility, and concentration at a decisive point. As to armament, Mitchell writes: "It can attack in front, on the flank, or behind." As to mobility he writes: "Its routes are absolutely straight; roads, railroads, etc., do not have to be prepared for it. It can converge on a point from any number of directions." Concerning concentration at a decisive point (page 12) he makes the claim that aircraft acting "from shore bases . . . will render a navy incapable of coping with an air force."

71. *Ibid.*, 12.

72. "Air Service Tactical Application of Military Aeronautics," 1. Mitchell begins by writing: "As a result of the War, it may be said that Aeronautics have developed and assorted themselves more rapidly than has any other military branch of the Military Service in all history."

73. *Memoirs*, 24. As Mitchell writes: "This was the first war in which aircraft had been used, and their scheme of working and fighting had to be developed as the necessity arose, and as the planes became more powerful and maneuverable."

74. "Our Army's Air Service," 5. Mitchell continues on pages 5-6: "A 500-pound bomb carries 250 pounds of explosive, 1000-pound bomb 500 pounds of explosive, 2000-pound bomb 1000 pounds; and 3000-pound bomb holds 1500 pounds of explosive. Compared to other projectiles, we find the following: The 16-inch armor-piercing cannon projectile, weighing [sic] more than one ton, carries only about 55 pounds of explosive. The submarine mine, used for harbor defense, weighing from 1,200 to 1,700 pounds, carries about 200 pounds of explosives. Water torpedoes range from about 200 pounds of explosives with a 1500-pound torpedo, to about 700 pounds with a 3,000-pound torpedo." Also in Mitchell's "Statement Regarding the Necessity of the Air Service" as assistant chief of the Air Service to the congressional committee on 4 January 1921 he is quoted (on page 1) as saying: "The results of experience show that air projectiles are the most efficient from the standpoint of explosives of any we ever have had. A one-ton cannon projectile has only 55 pounds of explosive in it. The air projectile weighing the same amount will have from 1,000 to 1,400 pounds of high explosive in it. This is because it is not necessary to give it great weight to have it go straight and insure a good trajectory."

75. "Statement Regarding the Necessity of the Air Service," 3. Here Mitchell has explained the three different branches of

aviation as pursuit, attack, and bombardment. Mitchell is advocating a strong force of pursuit aviation on pages 2-3 by saying: "If you are going to attack hostile bombardment airplanes, you must have pursuit aviation; if you are going to keep attack aviation in advance of the infantry, you must have a strong force of pursuit aviation." Mr. Anthony of the committee responds: "To put them down?" Mitchell: "Yes, sir. Pursuit aviation is the basis of an air force, just as infantry is the base on which the army rests." Mr. Anthony: "That is what we have been weak in?" Mitchell: "Yes, sir; we have not had any in this country. We now have a pursuit ship that is as good as any ship of its type in the world." Mr. Anthony: "That is the Thomas Morse pursuit ship?" Mitchell: "Yes, sir. There is no defense against an air force except an air force. No weapons operating from the ground can greatly affect aviation. We lost about one-tenth of one percent of our ships in Europe from anti-aircraft fire from the ground. It took from four to five thousand rounds from anti-aircraft cannon to hit one ship. . . . The only way you can get protection is to have the pursuit aviation and searchlight and missile throwing weapons working together." Mr. Cramton: "Is there any particular development in the attack on airplanes?" Mitchell: "You mean from the ground?" Mr. Cramton: "Yes." Mitchell: "There has been some development in Europe. We are still going along in very much the same way. Conditions, however, are very hard, so far as hitting ships in the air is concerned." Mr. Cramton: "You referred to the percentage in the last war. In the next emergency is it to be expected that there will be any great advance along that line?" Mitchell: "I think there will be, yes, but we will attack the anti-aircraft gun on the ground and very largely nullify it. Of course, we will have to stand our losses, like everybody else. To hit anything in the air, you have got to see it. Actually, the only defense against an air force is another air force, and only enough money should be put into anti-aircraft artillery which the air units themselves require to work with them. The air is a very big place; it is a three dimension proposition, so an airplane is often able to go through the air or over the clouds so that people on the ground can not see it."

76. "Statement Regarding the Necessity of the Air Service," 7. Here Mitchell is discussing the sinking of surface warships through aerial bombardment. Mr. Anthony of the committee has asked: "What is the situation in regard to the accuracy with which you can drop one of these bombs?" Mitchell: "We can hit very often, if we have to, because if necessary, we will come down

and lay the bomb on the deck. Here is a comparison between the accuracy of aerial bombing and cannon fire [indicating on chart]. Over 18,000 yards, we believe the percentage of hits, even with modern methods of fire adjustment, from the shore will be very small. We do not believe that, at 40,000 yards, you will make over one percent of hits with cannon, and we believe that, with the same number of airplanes required to adjust the fire, we can make at least 40 percent of the hits. As a large cannon has an accurate life of only 200 rounds, you will therefore get about two or three hits with it against a ship at 40,000 yards." Mr. Sisson: "That is over that distance?" Mitchell: "Yes, sir. The distance is nothing to airplanes. Our accuracy is the same up to the limit of our gas capacity. That ship has about a five and one-half hour supply of gas [indicating photograph], and she can work 200 miles off the coast. It is just as accurate at 200 miles as it is near the shore. All other countries have taken that into very serious consideration."

77. Skyways, 261. In the chapter on "Military Aviation," Mitchell writes: "Future wars will see aircraft used in great units, employed in much the same manner as regiments and brigades in the army [referring to the great air attack at St. Mihiel with 1,476 aircraft]. . . . As soon as combat became general, the main attack was launched by aircraft which had flown clear around both forces and attacked the enemy in the rear. This is the kind of strategy that will be exercised in the future. The air attack will come from whatever direction offers the greatest advantage to the attacker. He has the whole air to operate in."

78. Ibid., 275. In the chapter "Aircraft in War," Mitchell writes: "In the handling of air force units, a wide front or great distances between organizations is usually maintained, for two reasons. It offers a better defense against enemy bombardment, which always seeks to attack air forces while they are on the ground. Also, it is easier to launch an attack with air units placed far apart. The essence of air attack is to approach the objective from different directions so as to mislead the enemy, separate him into various detachments, maneuver him out of his position in the air, then combine one's forces at the crucial moment where they will do the most good."

79. Ibid., 262. Found in the chapter on "Military Aviation."

80. Winged Defense, 9-10. First published in "Aeronautical Era," 4. Mitchell further writes: "Armies may dig trenches, live in them, or sit around in them waiting for an enemy to attack them. This cannot be done in the air."

81. *Skyways*, 157. Mitchell goes on, on page 159, to explain that: "From his vantage point on high, the airman can see everything that lies on the surface of the ground or water." Mitchell makes a companion statement on page 7 of *Winged Defense*: "The pilots of these planes, from vantage points on high, see more of the country, know more about it, and appreciate more what the country means to them than any other class of persons." He makes a similar point about the aerial perspective during the war in Europe in *Memoirs*, page 143: "No one in the ground army had this advantage of getting over the country so much, and consequently none knew it as well as I." At the time of the preparations for the St. Mihiel attack, Mitchell notes in *Memoirs*, page 239, a similar view in writing: "Most of the officers on our general staff, with a few marked exceptions, had no appreciation of what this great air force meant. Not a single one, however, except Major Bowditch, had shown any inclination to go up in the air and see what was going on. Just think of such a thing! Here was a great military operation about to be undertaken, the success or failure of which meant everything to American arms. A tour in the air by the Commanding General or the Chief of Staff would have given them insight into the positions and locations of the enemy and our own troops which could have been obtained in no other way."

82. *Memoirs*, 85. Here Mitchell is referring to the psychological effects of aerial bombardment when he writes: "Not only the material effect of bombardment to be reckoned with, and it was constantly increasing, but the moral effect on the people was even greater. Women and children were paralyzed with fear. It was a menace from an entirely new quarter."

83. "Aeronautical Era," 103.

84. *Memoirs*, 238. Here (pages 238–44) Mitchell writes about the attack on St. Mihiel begun on 12 September 1918. "The first of September saw my headquarters permanently organized and a force of 1,476 airplanes and twenty balloons under my command, concentrating to join battle with the Germans. Thirty thousand officers and me handled the airplanes. They were disposed on fourteen main flying fields and a great many substations, while three large supply points handled the material for the Americans, French, British and Italians. . . . Nothing like this had ever been tried before. It marked the beginning of the great strategical air operations away from the troops. . . . The morning of September 12th dawned dark and cloudy, with

intermittent rain. Nevertheless, our Air Service with that of our Allies went over the lines."

85. *Memoirs*, 245. Mitchell precedes this statement with: "An airman may stay on the ground if he wants and let the other fellow go ahead, but if the other fellow starts blowing up everything, he will have to get up in the air and fight him, or allow complete destruction." This material concerns the attack on St. Mihiel during September 1918.

86. "Aeronautical Era," 100. Mitchell is referring to Royal Air Force air control operations in Iraq during 1921 and 1922.

87. "Look Out Below," 9. Here Mitchell is likely drawing on the Royal Air Force's successful air control operations in Iraq during 1921 and 1922.

88. *Ibid.*, 41.

89. *Ibid.* Mitchell continues on page 42: "They will act at great altitudes and will try to get the first punch in against the other fellow. Only a few will be back on the defensive because their value in the offensive is 100 to 1 to what it is in the defensive."

90. *Our Air Force*, 136. Found in the chapter, "Distribution of Material," and concerning the supply and support of air forces (pages 136-37). Mitchell writes: "If this is not done the different parts that it is necessary to use with the airplane will be separated, and the whole organization will be useless; because guns will be one place, ammunition another, motors another, wireless another, any one of which if lost will render operations impossible. . . . very careful consideration must be given to supply points which are to follow the fighting squadrons. These points should be selected with a view to having them make just as few moves as possible, and such moves as are made should be straight to the front or straight to the rear, not to one side or the other."

91. *Ibid.*, 139. Mitchell writes on pages 138-39: "The means of supply outlined above have to have the strictest kind of technical direction, that is, the Engineering Department has to watch the state of the equipment, condition of the engines, and how they are handled and run by all concerned in their use. This, it must be held in mind, should be different from the tactical control, which pertains to its use in battle and the method of operating against the enemy, so that we have two elements in an Air Service that have to work side by side—that is, the technical control of all equipment by the Engineering Section of the Air Service, and its tactical use by the fighting forces against the enemy."

92. *Ibid.*, 142.

93. "Air Service Tactical Application of Military Aeronautics," 1.

94. Winged Defense, 3. This chapter of Winged Defense was first published as "Aeronautical Era."

95. *Skyways*, 289. Mitchell also makes this point in "How Should We Organize Our National Air Power," page 6. "Aviation is very different from either armies or navies in its economic aspect. Every military airplane can be used in time of peace for some useful undertaking not necessarily connected with war."

96. "Air Service Tactical Application of Military Aeronautics," 1. Mitchell continues: "Before that time, nothing particular had been proved in a definite enough way so that one could be sure about the action of aircraft. It is true that a few airplanes had been used in the Balkan War, and that many demonstrations and experiments had been made, but the effect of actual battle conditions, with modern anti-aircraft equipment and cannon and with field conditions of landing and supply, required absolute proof on the field of battle both of the necessity for and the efficiency of this new arm."

97. *Our Air Force*, xxvi. Mitchell precedes this statement with:

In the European War we worked up a great military system, which we have largely disintegrated and dissolved. While national policies involving expense, and a lack of cause for the use of our military forces, may have required this in the popular mind, there is no reason why we should deliberately throw away the aeronautical position which we had acquired actually at the end of the War, because provision of an adequate air force involves a comparatively small expenditure in men and treasure in accordance with the protection which it gives the nation. It can be employed to the greatest advantage in useful pursuits in time of peace, and is a development, every commercial phase of which has a direct application to national defense.

98. *Ibid.*, 152.

99. *Skyways*, 18. As Mitchell notes in the preceding line, "We have only been flying for about twenty-five years."

100. "Air Service Tactical Application of Military Aeronautics," 13.

101. *Skyways*, 300. Mitchell continues on pages 300-01. "Creative developments occur in cycles. Certain schools of thought are started by individuals, the results of which are worked out to a certain stage, then there succeeds a lapse in

creation, when the practical features of the thing are developed, put into use and standardized. Ordinarily, scientists and engineers do not initiate the new ideas, because they deal with exact facts. Science means exact knowledge. Creative ability causes a man to look beyond the established facts of today, and is quite independent of scientific or mechanical training." In *Memoirs*, page 152, Mitchell writes: "The great trouble with starting anything new is to break away from the conservative policy of those who have gone before. This was especially true during the war, but in the case of our aviation, we had to take chances, because if successful, the results would be so vast; and if not successful, we would only suffer a slight decrease in efficiency."

102. "Aeronautical Era," 4. Mitchell writes: "The airmen fly over the country in all directions constantly; winter and summer they go, as well by night as by day. The average dweller on the earth never knows that above him aircraft in the United States are speeding between the Atlantic and Pacific, and from the northern frontier to the southern frontier, on regular scheduled trips. The pilots of these planes, from vantage points on high, see more of the country, know more about it, and appreciate more what the country means to them than any other class of persons."

103. *Our Air Force*, 154. In the chapter on "Civil and Commercial Aviation," Mitchell argues (pages 153-54) for the utility of aircraft in making the point that military aircraft can serve civil needs as well as military ones. "Military aircraft may be used by the civil departments of the Government to a greater extent than can any parts of the war machine, such as armies or navies, without impairing their efficiency." He goes on to cite the use of military aircraft for mapping the country, patrolling for forest fires, patrolling along the Mexican border to prevent smuggling, and connecting people all along the border where no other means of communication are practicable. He also argued that aircraft may be used for life-saving work, "and for many other things."

104. *Ibid.*, 155. Mitchell advocates a national aeronautical effort that promotes the development of aviation. He writes (pages 154-55):

For both our civil and commercial aviation, therefore, we need constant development along the lines indicated above. The surplus material which the Government has on hand can very well be sold, under proper conditions, to

commercial companies who desire to develop aerial routes through the country, or from our own country to other possessions, such as Alaska, Panama, Porto [sic] Rico, etc. This is the best use for equipment of this kind, which, otherwise becomes obsolescent, and is a positive detriment in case of a war against a first-class power. The same landing fields, and also any airways which are developed for the use of commercial and civil operations are also applicable to military work.

105. "Civil and Commercial Aviation," 173. Mitchell writes: "America is in a better position to develop commercial aeronautics than any other nation in the world." He also provides his thoughts on this matter on page 14: "The essence of civilization is transportation. The more rapid the intercourse between people the more highly what we call civilization will be developed. . . . Nothing throttles a people's development more than lack of transportation."

106. *Our Air Force*, 217. In the chapter "A Glance Into The Future Of Aeronautics," pages 217-18, Mitchell writes:

In the development of aeronautics, one has to be careful that the imagination does not run into unpractical channels when a question so unlimited as aviation is considered. Each thing in the development of aviation should be proved to a sufficient extent to warrant the entrance of the Government into it before it is attempted. The development of aviation, however, since the first flights of the Wright Brothers at Ft. Myers, Va., to the present, has been much more rapid and practical than in the time required for a corresponding development of steam engines and electricity, automobiles, the telephone and telegraph, or wireless telegraphy. Even with the instruments that we now have for navigating the air, and with proper arrangement of facilities as mentioned in this book, not only can military protection from attack be obtained, but a great use from a civil and commercial standpoint. Looking into the not very distant future, we can see the organization of our aeronautical resources so disposed that the minute war starts, our airships can cross the Atlantic Ocean within thirty-six hours, keep the whole area under observation, and report anything that comes across it. They will be able to cross the Pacific in seventy-five hours or less, and do the same thing in that area.

107. *Ibid.*, 222. Mitchell continues (pages 222–23): “While it is still expensive and somewhat dangerous, this is being overcome every day; and it is increasingly evident that the future national defense, future predominance in commerce, and the future economical development of a country lie in the air.”

108. *Winged Defense*, 120–21. In the chapter “The Effect Of Air Power On The Modification And Limitations Of International Armaments,” Mitchell writes: “Airplanes have a great application in time of peace in useful civil and commercial pursuits. The same airplanes can do this work that are suitable for duty in war and for national defense. In fact all aircraft developments, the factories that make them, the airways that are established for civil aviation and the civilian pilots and crews, are distinct military assets, and can bring in a return in time of peace, thereby reducing the national expenditure necessary in their maintenance if they were kept solely and exclusively for war. Also see endnotes 103 and 104.

109. “Our Army’s Air Service,” 15. Mitchell advocates on page 14 a national aeronautics program that, in serving the needs of civil aviation would also serve the needs of military aviation. “It is necessary to organize a real system of airways through [sic] the country. With a good system of airways an air force can be shifted with great rapidity from one coast to the other, or from northern to southern frontiers.” That organization must be headed by an airman (pages 15–16): “We are convinced that aviation can only be put on its feet in this country through the unification of all air activities, so as to obtain an economical administration of the most important element under persons who are actually familiar with flying and the things that go with it.”

110. *Our Air Force*, xxiv. Also see endnotes 103, 104, 108, and 109. On pages xxiv–xxv Mitchell writes:

The only efficient protection against an enemy’s aircraft is an air force capable of defeating it. In the development of national aeronautics, commercial aviation is almost as great an asset as if it were regularly incorporated into fighting units. The commercial equipment and pilots used have an immediate military application, either as training equipment, as bombardment equipment, for the heavy commercial airplanes, or in reconnaissance on account of the knowledge of the country which the pilot possesses. In addition, the system of airdromes, air lanes, and aids to air navigation required to handle commercial aviation are

exactly those which we would need in case of war. The development of commercial aviation would work “hand in glove” with the protection of the country from air attack.

Mitchell also comments on pages 157-58:

So, we may confidently expect that, when a system of airdromes is established through the country, and proper rules for the regulation of aircraft have been prescribed by law are well administered, which will guarantee to the public safe transit through the air; when we have developed suitable types of aircraft essentially for commercial purposes, we shall see a greater development of commercial aviation in the United States than in any other country in the world. Our country is suited to it; the climate is better; our resources are such that we have all the raw materials necessary for the construction of airplanes; and our people take to it very naturally. We must remember that, as we develop our commercial power in the air, just so much more do we develop our means of national defense.

111. *Winged Defense*, 94. In the chapter “Civil and Commercial Aviation,” Mitchell addresses the national organization of aeronautics and the need for airmen to establish “uniform rules of the air.” “Another feature of commercial aviation development is the necessity for uniform rules of the air, examination of the pilots, and examination of the airplanes in a way similar to that which is done for ocean shipping.” In his beliefs that national aeronautics depended on all aviation, he cautions on page 93: “On the other hand, regulations must not result which will crowd out the small operator or interfere with the development, particularly, of light planes.”

112. “Col. Mitchell’s Statements on Govt. Aviation,” 320. This is taken from the statement Mitchell made that precipitated his court-martial. He once again expresses his views on how our national aeronautics should be organized.

113. “Statement Regarding the Necessity of the Air Service,” 31. Mitchell is discussing the need for an air force in time of peace as well as war. Mr. Slemp puts forth a question on funding: “Does the \$17,000,000 you are asking for provide for the securing of a complete unit, or will you ask for another \$17,000,000 next year, and then another \$17,000,000 the following year?” Mitchell: “What we want to lead up to is this. Aviation must be ready when the war starts, because that is when aviation will be called on. That is when it will have the

greatest effect, and we want to keep the organizations we have in service equipped with modern equipment and have enough in storage to last for two or three months of an ordinary war. Next year, we will probably ask for more than that because we are going to develop the air reserve forces. Airplanes do not last forever and develop rapidly. Relative strength in the air depends on what the other fellow has." Mr. Slemp: "Then what sort of an ultimate program do you have in mind?" Mitchell: "My idea is that we will have an ultimate program of about \$45,000,000 a year for construction." Mr. Slemp: "When you are spending that \$45,000,000 you will have reached the point where you have production up to the point where it becomes a maintenance proposition?" Mitchell: "That is the point, and much cheaper than any other arm of the Service with more protection."

114. Our Air Force, 27. Mitchell writes:

The first thing for us to do in applying air power is to lay out a regularly coordinated series of airdromes, as air stations are called, provided with meteorological equipment—that is, everything necessary for telling what the weather is in that vicinity, what it may be in other places, and what weather to expect the following day. A system of wireless telegraph and telephone communication not only will give information and orders to all airplanes on these airdromes while they are on the ground, but it will give them weather warnings, any necessary orders, and guide them through the rain, hail, snow or fog while in the air. A system of airdromes and airways through the country is almost as necessary in the application of an air force as is a system of gasoline and oil stations, with all their accompaniments of roads and telegraph and telephone lines for the automobilist, or a similar organization for the railroads.

He also writes (page 24): "Not only should a country have permanent airdromes located in time of peace that are always ready to be occupied in case of necessity, but ample provisions should be made to locate them wherever necessary in time of war."

115. Our Air Force, 199.

116. "General Mitchell's Parting Address," 84. Mitchell makes the point that aircraft are the best defense against other aircraft, and thus the need for an air force: "The only adequate defense against hostile aircraft is our own aircraft. Two basic contentions

have always been advanced by armies and navies concerning aircraft. These are that anti-aircraft weapons are a positive defense against aircraft and that battleships cannot be destroyed by aircraft. Both are absolutely and positively fallacious. To what, then, is the true development of a modern system of national defense to lead in the future? It is to establish the air force as the first line of defense of the country. Actually it is now, whether recognized as such or not."

117. *Our Air Force*, 179. In the chapter "Aviation Over The Sea," he advocates on page 178 the organization of an air force for national defense from "air attack not only from the [aircraft] carriers, but probably from bases seized and occupied on land."

118. "Look Out Below," 9. Mitchell is advocating an independent air force: "If by any chance the army and navy air forces acted together, they would find themselves quite unable to coordinate activities. . . . They have had no combined training. . . . Their system of work and chain of command are entirely different."

119. *Memoirs*, 245. Mitchell is writing of the attack at St. Mihiel in September 1918.

120. "Statement Regarding the Necessity of the Air Service," 24. Refer to endnote 55.

121. *Our Army's Air Service*, 3. Mitchell is referring to the early attempts by the United States to manufacture a combat airplane to employ in World War I. On pages 2-3 he writes: "There was really only one kind of service plane manufactured in this country, namely, the DH-4 with the Liberty motor. It was hoped by those who decided on its construction that this airplane, an English type, would be able to answer the requirements of observation aviation, bombardment aviation, and even pursuit aviation. These branches of aviation are just as distinct as artillery is from infantry is from cavalry; and the result of this effort in construction was that the airplane did not fit any of them. So, at the time of the armistice, when we took check of what we had in this country, we found that we had made only one type of service airplane, and that of a foreign pattern, which was practically obsolete."

122. *Ibid.*, 75. This found in the chapter "Attack Aviation" and refers to pursuit aviation, bombardment aviation, and attack aviation. On page 35 Mitchell lists observation aviation as a fourth type of aviation: "The fourth, which is an auxiliary and really is used as an inseparable companion of other organizations is called Observation Aviation." Mitchell emphasizes the point that: "All branches of aviation depend on

each other to a greater or less extent in order that they may be able to carry out their functions in the air."

123. *Ibid.*, 35. In the chapter "Branches of Aviation and Their Use in War," on page 44, Mitchell writes:

All branches of aviation depend on each other to a greater or less extent in order that they may be able to carry out their functions in the air. First, Pursuit Aviation has to attack the hostile Pursuit Aviation, and in case it is successful, it attacks the enemy Bombardment, Attack, and Observation Aviation. Our own Observation cannot work unless it is adequately protected by Pursuit Aviation, against the enemy Pursuit Aviation; and neither can the Bombardment or Attack Aviation operate alone against a strong enemy force. In the carrying out of each mission assigned to a particular branch of aviation, it is necessary for them to know just what the other branches are doing." To achieve the integrated air operations that he speaks of Mitchell notes: "All air forces, therefore, have to be entirely informed of the operations and duty which each part is called on to perform, and in the successful handling of an air force, these are announced every day or several times a day in orders and instructions.

Also see the quotes associated with endnote 124 and endnote 175.

124. *Ibid.*, 38. Refer to endnote 123.

125. *Memoirs*, 244. Mitchell relates the preparations for the attack on St. Mihiel. He felt that orders, especially to an air force, had to be clear and simple (pages 234–35). "When commanding, I always drew up my own orders for the military operations of the fighting units, and personally checked the sending and receipt by the unit commander of their special orders. When orders were not obeyed, it was usually the commanding officer who was at fault. Either the orders had not been delivered or they were so written that nobody could understand them."

126. *Ibid.*, 234. See also endnote 125.

127. *Our Air Force*, 33.

128. *Winged Defense*, xvii–xviii.

129. *Ibid.*, 5–6.

130. *Ibid.*, 109. Mitchell continues on pages 109–10: "Submarines will be used in and on the seas for controlling sea lanes of communication and assisting air power. Armies will be used on land for insuring domestic tranquillity, holding

operating bases for aircraft and seacraft and, in a last analysis, together with air power against hostile armies.”

131. *Ibid.*, 113.

132. *Our Army's Air Service*, 12. Refer to endnote 41.

133. *Our Air Force*, xvii–xxi. Mitchell writes: “In order that an air force may be developed to the point where it will represent a real safeguard, it is necessary that an organization be formed whose main function will be the employment of aircraft in all their various fields of activity.”

134. *Ibid.*, 10. Mitchell writes: “The use of aviation, both tactically and strategically, was beginning to be understood in its rudiments by all the ground troops at the end of the War. It was known definitely, however, only to the Air officers themselves. The air force had become as specialized in its own work in the air as the armies were on land and the navies on the water. Pursuit, Attack, and Bombardment aviation were just as different as Cavalry, Infantry, and Artillery.” Also see endnote 121.

135. *Ibid.*, 13–15.

136. “Statement Regarding the Necessity of the Air Service,” 2. Refer to endnote 75. Also see endnotes 110 and 116.

137. *Our Air Force*, 15. Mitchell writes: “Our policy should be to maintain as strong an aviation as is necessary to defend ourselves against the combined attack of our probable adversaries. Our method for carrying this into effect should be to have the necessary air forces always ready at the outbreak of war, because this is the first of our arms that will enter into combat and it is upon a favorable air decision that the whole fate of a war may depend.”

138. “Aeronautical Era,” 4. Mitchell continues this statement with: “because all the places capable of building aircraft will be bombed and all the big air stations that train pilots and flyers will be destroyed. Even if the country on the defensive is able to create small parcels of aviation, they will be destroyed in detail, one after the other, by the victorious air force which not only has control of the air but is protecting its own interior cities that manufacture and turn out their equipment, airplanes and supplies.”

139. *Our Air Force*, 20. Mitchell writes in the chapter “The Application of Air Power.” “Air power is applied by means of definite military air units which are organized, armed, equipped and trained for a definite and specific purpose. One kind of airplane or air organization can no more perform all the duties required of an air force than can Artillery, Cavalry or Infantry acting alone form a whole army.”

140. "Statement Regarding the Necessity of the Air Service," 32. Here Mitchell concludes his statement.

141. *Our Air Force*, 202-05.

142. *Memoirs*, 240. Mitchell goes on to explain more by writing: "They must be communicated with through the air, that is by radio or visual signals. When air forces are committed to a combat they cannot be withdrawn and redispersed ordinarily, but must come back to the airdromes to refuel and replenish before renewing the fight."

143. "Statement Regarding the Necessity of the Air Service," 13. Here Mitchell is responding to questions about the employment of aircraft against land and water targets. Mr. Slep poses the question: "Have any of the other nations any illustrations by which you could demonstrate the effectiveness of the air service over water?" Mitchell: "There have been experiments carried on by England that we do not know about." Mr. Slep: "I am not speaking about experiments, but operations in actual war." Mitchell: "No, sir there were none during the war of any importance." Mr. Slep: "Then this war was conducted for four or five years without airships demonstrating any effective usefulness outside of keeping other airships or other air vessels off, that is, so far as naval vessels are concerned?" Mitchell: "That is correct, but there was no war on the water which involved aircraft to any great extent." Mr. Slep: "Then we have got to eliminate the experiences of the past in considering the future and go on theoretical possibilities." Mitchell: "It is not theoretical, as our experiences point precisely to what I have said." Mr. Slep: "They had their chance for five years and they did not do it." Mitchell: "They did not have the equipment to do it. The war in Europe was essentially one on land. It was not a naval war. The Allies controlled the sea with greater security than any nation ever controlled the sea, and they concentrated all their air forces on land, where the maximum decision was being sought." Mr. Slep: "But at the same time Germany was controlling the air." Mitchell: "No sir, Germany was not. The same conservatism in the development of new methods of war is what has wrecked many nations before and what has made every war we have had dangerous to our well-being, and very expensive."

144. *Ibid.*, 17. Here Mitchell is responding to the question of a combined Air Service. The question is posed by Mr. Anthony: "Your argument really leads up to the advocacy of a combined air service." Mitchell: "There is no other efficient solution of the air problem, if you are going to get on a basis of efficiency. If you

scatter the air force all around, it leads to double overhead, to a double system of command, and to many other difficulties. It has been proved wrong everywhere. We had ships flying over the vessel on which Senator Harding returned from Panama the other day, and the Navy had some airships there and we were getting in one another's way. It would be fatal in war, as it was in Europe at first." Mr. Anthony: "And they were all under separate commands?" Mitchell: "Yes. The British at first had the same thing, but they learned better when the German raids were on during the war. The German Gothas flew over London without any particular difficulty just for that reason. The Army Air Service worked over the land and the Navy over the water. Neither did anything; the German Gothas were slow ships, but there was no defense whatever against them. Finally, when they got a united air service and the air defense organized, it stopped the airplane and Zeppelin raids." Mr. Cramton: "Have any of the other nations adopted a unified air service?" Mitchell: "Yes, sir; England has an entirely unified air service. France has a bureau of civil aviation, and still has an army and a navy air service, but their navy air service amounts to almost nothing. Italy has her army air service run everything. It makes details for work with the navy, as I understand it."

145. *Ibid.*, 18. Here Mitchell is responding to questions about commercial aviation's contribution to national defense. Mr. Cramton poses the question: "To what extent is commercial development of that kind [referring to commercial air passenger service] beneficial to our national defense?" Mitchell: "Every pilot, every ship, and every airdrome are distinct assets as part of the national defense. What the Post Office Department is doing is a most efficient adjunct to the national defense. We could have not gotten an airway across the country unless that had been done. Airways are essential to the operations of military and commercial aviation."

146. *Ibid.*, 21. Here Mitchell is discussing his plan for air defense of the nation.

147. "Air Service Tactical Application of Military Aeronautics," 8. Mitchell continues on pages 8-9: "The place for the concentration of the air forces on various airdromes is prescribed, the system of supply for personnel, airplanes, ammunition, and all other accessories, and the plan of liaison. This requires liaison in the air between the various kinds of airplanes when engaged on missions. . . . The general method according to which Aviation will be used is prescribed. For instance, in the operation at St. Mihiel, in which the American Army attacked a salient, the

offensive Aviation acted against both sides of the salient alternately so as to catch the hostile Aviation between them. The plan of employment prescribes methods by which this shall be carried out, the amount of Aviation that will be assigned strictly for offensive operations against the enemy's air and ground forces, and the part that will be assigned for the immediate protection of the ground troops. . . . The general plan of employment having been prescribed a plan of air reconnaissance is made, which includes specifically the objects that will be reconnoitered for all Observation Aviation. . . . The third plan is the plan for bombardment, which prescribes the objectives, the specific targets, the methods by which they shall be attacked, and the size of the projectiles to be used."

148. Skyways, 72. Mitchell goes on to explain: "The air is in a state of constant motion much like the waves and currents of the sea. While sea water is more or less of the same consistency everywhere, the air is subject to very great changes." Mitchell discusses "the degree of visibility such as fogs, heavy rains, snow, sleet or clouds," and "the air itself, when it is directed hither and thither by heavy winds, storm, squalls or hurricanes." He writes that: "A good weather forecasting system will give notice to the aviator as to where the storms or other hazards are, what areas they cover, how deep they are (that is how many feet above the ground), and how long they will last."

149. Ibid., 92. Mitchell writes not only of the importance of the airdrome and its workings, but also the handling of air traffic and airways. He writes: "Although the air is almost limitless in scope, it is remarkable how many collisions may occur if energetic measures are not taken for traffic control."

150. Ibid., 135. Mitchell's discussion is directed at such proper aircraft design as: "The engine should always be separated from the gas tanks by a solid metal firewall." He also, in this chapter, writes on the parachute, mentions "efficient landing gear, instruments for fog flying and a good weather and radio service" as being "considered as important safety devices," and about aircraft design to prevent stalls.

151. Our Air Force, xix.

152. "Statement Regarding the Necessity of the Air Service," 20. Mitchell is discussing the air defense of the nation. In commenting on the need to be prepared for an air attack, he is quoted as: "That leads us to a consideration as to what our policy should be in respect to aviation. Our aviation doctrine should be find out where the hostile air force is, and to destroy it as rapidly as possible. Our policy should be to keep as large an

air force as we need for local defenses behind the Atlantic Coast, a similar force behind the Pacific Coast, and, between the two Coasts, as much as is necessary so that, when it reinforces either coast, it will be sufficient to secure and maintain ascendancy in the air."

153. *Winged Defense*, 9. "Great contests for control of the air will be the rule in the future."

154. *Our Air Force*, 18. This located in the chapter "Characteristics of Air Power" and is in reference to the German defenses of World War I.

155. *Ibid.*, 23. Located in the chapter "The Application of Air Power," Mitchell goes on to write: "In fact, without air supremacy, an army cannot be pursued even after a tactical victory has been obtained, because the retreating army can completely shield its own movements, and at the same time know every move of the pursuer."

156. "Air Service Tactical Application of Military Aeronautics," 2. On pages 3 and 5 Mitchell describes the "principle divisions of Aviation" consisting of pursuit aviation, bombardment aviation, and attack aviation. "The remaining branch of aviation to be considered is called Observation Aviation." Pursuit aviation: "uses the swiftest, most maneuverable and fastest climbing airplanes of any branch."

157. *Memoirs*, 82. Mitchell also addresses the character of the pursuit pilot by writing: "A man cannot stand this pursuit game very long at a time without becoming over-careful, and when this stage is reached, it marks the end of a good offensive pursuit pilot."

158. *Our Air Force*, 169. This located in the chapter "Aviation Over the Sea."

159. *Ibid.*, 46. Mitchell writes: "Nothing can resist the attack of Pursuit Aviation properly handled, because it utilizes its power in bringing flank, reverse and frontal fire in three dimensions to bear against the air force it is attacking. Consequently, the only aviation capable of challenging the supremacy of Pursuit Aviation is other Pursuit Aviation."

160. *Ibid.*, 49. Mitchell continues on pages 49-50: "When one appreciates the swiftness of thought that is necessary to handle Cavalry, which, at its very maximum, even when charging, more than about twenty miles an hour, then it may be imagined what qualities are necessary in the Pursuit Aviation leader, when the pursuit airplanes move over one hundred and fifty miles an hour, and dive at nearly double this speed with the enemy

coming at approximately the same speed, possibly surprising him or speeding against him from several directions at once."

161. *Ibid.*, 53. Mitchell writes:

Nothing can contest with it for supremacy in the air. All kinds of Bombardment Aviation are completely at the mercy of Pursuit Aviation. Observation Aviation cannot act without its protection, while heavily armored attack airplanes, no matter how well protected, will be shot down without the assistance of Pursuit Aviation. . . . The ground troops think that Observation Aviation is the all-important element, because they are brought more closely into contact with it. They seldom see the battles of Pursuit Aviation, which take place thousands of feet up in the air, and miles into the enemy's country. It is on these contests, however, that the safety and well-being of all branches of aviation rest; whether the enemy will be blinded in his air reconnaissance, which will allow his troops to be informed of every move; whether his Bombardment Aviation can drop the huge projectiles, which are used to-day, [sic] on his enemy's troops and strategical centers; or whether his Attack Aviation can shoot up the advancing columns of Infantry on the roads, or destroy tanks, the motor trains and railroad cars. Without an adequate and efficient Pursuit Aviation, a nation is helpless in the wars of to-day [sic].

162. *Ibid.*, 92.

163. *Ibid.*, 159. Mitchell continues: "On the land it is of first importance that the enemy be prevented from seeing what the movements may be of one's own Army; but on the sea, not only is this the case, but in addition shipping forms an ideal target for air attack."

164. *Winged Defense*, 26. Mitchell continues: "Just as power can be exerted through the air, so can good be done, because there is no place on the earth's surface that air power cannot reach and carry with it the elements of civilization and good that comes from rapid communications."

165. "Report of Bombing Maneuvers Conducted Off Cape Hatteras, 5 September 1923," Maxwell AFB, Ala., USAF Historical Research Agency, document 248.222-71, 24. In the "Conclusions" section of this staff paper (pages 24-25), Mitchell writes:

Our scheme of national defense should be revised at once. It should be based on the following principles: (a) An Air Force should be provided as a means of frontier and coastal defense, both against seacraft and against aircraft. For fighting against aircraft all means of defense against aircraft should be attached to the Air Force. (b) A Navy should be organized and equipped to take offensive on the high seas, and not be employed along and close to the coast. Such Air Forces should be assigned to the Navy as can go to sea with it and fight with it on the high seas. (c) Navy control, so far as it effects coast defense, should cease two hundred miles from the coast. Complete control and responsibility for the defense of the land should reside in the Army and it should be organized to accomplish this mission. Navy driven from the high seas must be protected by the Air Force and the Army. (d) At present there is a complete lack of liaison or system about our national defense. The duties are distributed.

166. "Air Service Tactical Application of Military Aeronautics,"1.

167. *Ibid.*, 11.

168. "Statement Regarding the Necessity of the Air Service,"

1. Here Mitchell is making his opening remarks before the committee.

169. *Ibid.*, 12. Here Mitchell is responding to a question posed by Mr. Slemp: "You have not a single practical illustration of the success in battle of the experiments which you think could be put effectively in use." Mitchell: "Yes, sir, we have." Mr. Slemp: "I am talking about their use in battle." Mitchell: "In so far as the ships are concerned?" Mr. Slemp: "So far as the use of airplanes against a naval force or an air force is concerned you have not an illustration of a single successful attack or defense, have you?" Mitchell: "Yes, sir, we have." Mr. Slemp: "Where?" Mitchell: "Take the battle of the second day at Montfaucon in our attack in the Argonne." Mitchell goes on to describe the success of air attack on the enemy's airplanes and airdromes. Mr. Slemp: "That is an attack of one airplane against another airplane." Mitchell: "Perhaps I did not understand your question. We kept those people off." [referring to the German air attackers] Mr. Slemp: "You kept the airships off." Mitchell: "Yes. You mean the direct land attack?" Mr. Slemp: "Yes. You are substituting airplanes for something on the land or on the water?" Mitchell: "No, sir; I am saying we should first get control of the air, and

then work directly in combination with whatever is on land or on the water to further the main object of the campaign."

170. *Ibid.*, 25. Here Mitchell is responding to a question by Mr. Anthony: "Of the three types of ships you are asking for, which is the most essential?" Mitchell: "Of course, the pursuit ship is the most essential always because you cannot control the air without the pursuit ships." Mr. Anthony: "That is the first thing you ought to have?" Mitchell: "Yes, sir, and next is the bombardment ship and the next is the attack ship."

171. *Our Air Force*, 41.

172. *Winged Defense*, xviii.

173. *Ibid.*, 6.

174. *Skyways*, 273.

175. *Our Air Force*, 44–45. Also see endnote 123.

176. "Aeronautical Era," 100. Here Mitchell is referring to the organization of Great Britain's air force. He writes:

Now it is reported that the organization of Great Britain's whole military force has gone so far as to make an air officer responsible for the whole defense of the British Isles. In case of war in the future, this air officer will have under his orders not only the air force, but also the army and navy for the protection of the islands. . . . His means of reconnaissance and of gaining information of an enemy hundreds of miles away from his frontiers are greater than any means possessed by either an army or a navy. His air forces move many times as fast as any ground or water service, consequently he is in a better position to know where an enemy will hit and what measures should be taken to protect his country and combine everything in the national defense—air, land and water.

177. *Skyways*, 274. Mitchell writes on page 280: "Combat in the air is a grueling contest for the individual. The strain on him physically and mentally and on his morale is terrific. The combat of the single seater ends invariably in the death of one of the contestants. No quarter is asked or given. On the other hand, more chivalry is displayed than in any other branch of a fighting service."

178. *Winged Defense*, vii.

179. *Ibid.*, ix.

180. "American Leadership in Aeronautics," 148. Mitchell refers to the progress in aviation equipment, organization, and materials that were realized during World War I.

181. *Winged Defense*, 7.

182. *Ibid.*, 8.

183. *Ibid.*, 31–32. Mitchell writes: “The elements of air power are very numerous and complicated. To begin with, the personnel: officers, mechanics, designers, manufacturers, engineers, and inspectors, all have to be created especially for aviation work. This requires a long period of time. It must be based on the proper system of training, while the training, itself, must be based on how air power is to be used. The work of the air force depends on the men that fly the planes, not primarily on those that remain on the ground.”

184. *Our Air Force*, 45. See the quote associated with endnote 175.

185. *Ibid.*, 110. In the chapter “Flying Personnel,” Mitchell writes:

So far we have spoken of the various branches of aeronautics, their employment, the airplanes or airships that are used, and their accessories. The most important element in aeronautics, however, as it is in any other undertaking, is the personnel which must direct the Air Service and operate and construct the airplanes and airships. No one can know the air except one who works and travels in it, and a thorough air education can only be acquired by long study and experience in this science and art. The greatest handicap under which aeronautics has labored in all countries and particularly in the United States, has been the fact that the Government agencies charged with the development of aviation have, in practically every case, been organized with a non-flying direction at their head, which could not possibly know or appreciate the problems concerned in its development.

186. *Ibid.*, 111.

Many officers could be found who could keep papers straight, attend to so-called administrative details, and do everything except fly. They absolutely broke down, however, because they knew nothing about tactical handling and use of aircraft. Whenever a new military branch begins to develop, creative minds must be developed to handle it. Men do not acquire this ability by intuition, but have to learn it by long study and practice. Tactical ability always is the most difficult to obtain—by this is meant the actual art of handling troops in the face of the enemy. Technical

ability is an exact science, and can be learned very largely in schools and colleges. The duties of an air force lie in the air, and it is there that all the personnel concerned with its handling must receive the maximum amount of training.

187. *Ibid.*, 112.

188. *Ibid.*, 114.

189. *Ibid.*

190. *Ibid.*, 118. Mitchell continues: "His individual action in the presence of the enemy, and the reports he brings back, or his general estimate of a situation, may mean the success of a whole operation in the air, on the ground, or on the water." Also see the quotes attached to endnotes 177 and 194.

191. *Ibid.*, 127-28.

192. *Ibid.*, 131.

193. *Ibid.*, 195. Mitchell continues: "This is due to the character of the men who have gone into this work, the common danger to which they are all exposed, and the appreciation of these qualities of one by another."

194. *Skyways*, 63. Mitchell writes in the preceding lines that: "Most healthy young men or women from 16 to 40 years of age can be taught to fly an ordinary airplane. A great majority of these may become very good pilots for transport or passenger carrying machines in time of peace; but the requirements for a military aviator call for more concentrated physical and mental ability in the individual than has ever been necessary in any calling heretofore."

195. "Statement Regarding the Necessity of the Air Service," 4. Here Mitchell is responding to a question by Mr. Anthony: "Did either side [referring to the Germans and the Allies] have a pronounced ascendancy in the air?" Mitchell:

We were beginning to get it at the end of the war. You can see from our ratio of victories that our percentage of air losses was constantly falling in proportion to the number of the enemy that we shot down, showing that we were gradually gaining control. This was only after a series of tremendous air battles. The Germans were so heavily attacked in the air that they were put on the defensive and could not keep up their supply of men and material. The men are the all important things. It is very necessary to keep up your supply of skilled pilots in connection with aeronautical operations. You can usually keep ahead of your material after you get to a certain point of

development in your production. It takes years to develop a really efficient aviation personnel.

196. *Memoirs*, 25. Mitchell writes on page 26: "It was impractical and foolish to attempt to use mediocre personnel for this work, because they would only be killed off, one after another, and added to this would be the loss of the good airplanes they flew."

197. "Statement Regarding the Necessity of the Air Service," 28-29. Mitchell is advocating equitable pay for Air Service personnel. He notes that enlisted pay differs between the services for the same level of enlisted man and that: "This matter of pay should be regulated as soon as practicable."

198. *Ibid.*, 29. Mitchell is advocating an equitable promotion system for Air Service officers. Mitchell notes the "entire disproportion of field officers in the Air Service as compared to the other branches."

199. *Ibid.* Mitchell concludes his advocacy as noted in endnotes 197 and 198.

200. *Skyways*, 65. The same thought is repeated in Mitchell's book *Memoirs of World War I*, 193. "He is there alone, suspended in space, with no companion to share his misery, no man at his elbow to support him, as in the infantry on the ground. When he is wounded and falls, it is for thousands of feet, instead of two or three, as a man on the ground does."

201. *Ibid.*, 65-66. Mitchell explains the mindset he ascribed to "unhesitating obedience" as "In that case the subordinate is not supposed to think too much. . . . This kind of discipline has been designed for the average man. It is only within the last generation that most of the men composing armies could read or write."

202. *Memoirs*, 204. Mitchell's comments were in relation to his brother's death due to an aircraft crash. Mitchell writes: "While primarily his death was [due] to a weak airplane, I think his eyes were not as good as they should have been and that he stretched matters in his physical examination to get by the doctors, in his anxiety to be in the Air Service and near me." Mitchell also adds in *Skyways* (page 68) that "In order to fully understand conditions, the doctor should be a flyer himself."

203. *Memoirs*, 184. Here Mitchell is writing about the organization of the air forces of the American Expeditionary Forces in the spring of 1918.

204. *Ibid.*, 194. See endnote 203. Mitchell went on to characterize his observations on page 195: "The General Staff

was trying to run the Air Service with just as much knowledge about it as a hog has about skating. It was terrible to have to fight with an organization of this kind, instead of devoting all our attention to the powerful enemy on our front."

205. *Winged Defense*, 22. Mitchell also writes: "Air power carries out its military missions, competes in battles in the air and attacks ground and water establishments without participation in its conflicts by either armies or navies."

206. *Skyways*, 256. Mitchell states on pages 256-57 "as these two branches of military service will take a position second to that of air power, and will act principally as aids to it. Armies will hold the land. Navies will no longer be able to remain on top of the water where they are a sure prey to aircraft, but will have to act in submarines beneath the surface. On page 262 Mitchell once again makes this point by writing: "All our old concepts of armies, navies and military strategy have to be changed, so great has the influence of air power become." He repeats the idea on page 264: "Men and nations still have differences and as long as these differences exist, they will be magnified and result in war. Those who stick to the old systems of armies and navies and do not utilize air power to its fullest extent are the ones who will be beaten."

207. *Our Air Force*, 221. Mitchell writes again on this point in "How Should We Organize Our National Air Power," 9: "Air power, therefore, has to be employed as a major instrument of war, no matter whether a land force or a sea force is acting on the surface of the earth." In the same article he continues on page 214 by writing: "A modern organization of a country's military power, therefore, indicates that aircraft will be used over both land and sea for combating hostile air forces, demolishing ships on the sea and important targets on the land."

208. "Statement Regarding the Necessity of the Air Service," 4. Mitchell also writes in "Aeronautical Era," 4: "Armies on the ground or ships on the water have always fought on one surface because they could not get off it. The air force fights in three dimensions—on the level, from up above and from underneath."

209. "Aeronautical Era," 103. Mitchell writes further on this idea in "How Should We Organize Our National Air Power," 216, discussing the fiscal aspects of the control of aviation by the older services: "So long as the budget for the development of aircraft is prepared by the Army, Navy or other agency of the Government, aviation will be considered as an auxiliary and the requisite amount of money, as compared with the older services,

will be subject to the final decision of personnel whose main duty is not aviation.”

210. *Winged Defense*, xv. Mitchell further explains his views on armies and navies in “Aeronautical Era,” 103, as he writes:

In considering the relations between armies, navies and air forces, we may say that armies have reached an epoch of arrested development in which the controlling factors, as they have always been, are a man's physical strength, his power to march, and his power to see. The use of his weapons entirely depends on these attributes. Their augmentation by mechanical transportation and raised platforms for observation do not alter this general condition. . . . Navies, however, are able to control only the areas of water outside the cruising radius of aircraft. These areas are constantly diminishing with the increasing flying powers of aircraft. It will be impossible for them to bombard or blockade a coast as they used to, or ascend the rivers, bays, or estuaries of a country adequately provided with air power. . . . Differing from land armies, which are in a stage of arrested development, navies are in a period of decline and change. The air force is the great developing power in the world today.

211. *Ibid.*, 121. Mitchell continues on page 122: “The action of armies and navies on one plane or dimension—that is, on the surface of the ground or the surface of the water—is slow in execution as compared to operations in the air. They also require tremendous and expensive organizations for their maintenance and upkeep on account of the great number of men and equipment which they need. The advent of air power has completely changed this.”

212. *Ibid.*, 122. See endnotes 211 and 205.

213. “Billy Mitchell's Resignation Speech,” *Montgomery Advertiser*, 2 February 1926, 2. Here Mitchell is referring to the lack of a national plan for funding and developing an air force. He is quoted as saying: “The United States remains today unorganized for national defense. In spite of the expenditure of nearly five hundred million dollars for aviation since the war, and the loss of scores of our airmen, we have no real military air force for the protection of our great country. We are left hopelessly behind in our civil and commercial aviation, and we have no plan or system for funding and developing this most important agency.”

214. "Statement Regarding the Necessity of the Air Service," 31. Here Mitchell is responding to a question from Mr. Cramton: "You get control of the air and then you are able to bomb the enemy forces. Does not that to some extent make the air force a substitute for an artillery attack?" Mitchell: "No, sir; the ultimate answer is getting man to man and letting them fight it out. I think with long range artillery, it would have some effect. I think you have to balance those things according to the amount of money you have to spend. An air force attack, such as you speak of, is as an aid to an army and does away with no specific arm, just as a navy may assist in a landing."

215. "General Mitchell's Parting Address," 84. See endnote 116.

216. "Statement Regarding the Necessity of the Air Service," 1. Here Mitchell is making his opening statement to the committee. He begins with:

Mr. Chairman, I would like to explain first what I think should be the general idea underlying the development of the Air Service in this country. In order to apportion the money for national defense properly, we should make an accurate estimate of all of the capabilities of each branch of the service, that is, what the Army can do, what the Navy can do, and what the Air Service can do. If we do not make an accurate estimate and a possible enemy does make one, we will be under a great disadvantage in case of a great emergency. During the war, the Air Service was developed essentially for fighting over land, as the Allies held the sea to a greater extent than any great combination has before. To begin with, aviation was used entirely for observation purposes; that is, for reconnaissance, for adjustment and regulation of artillery fire, for keeping contact with the troops so as to report their position. At the end of the campaign, the aviation was 80 per cent [sic] offensive and only about 20 per cent [sic] observation. The moment that airplane attacked airplane, the principle mission of the air force was to whip the hostile air force, so as to enable the airplanes to observe, to drop bombs, or attack troops. So that, today, the principle mission of an air force is to destroy the hostile air service, just as the mission of an army is to destroy a hostile army.

217. Winged Defense, 18.

218. *Ibid.*, 15. This chapter was previously printed in "Aeronautical Era," 99. In this essay Mitchell observes on page 103: "Hindenburg looked back to Hannibal's Battle of Cannae, and made his disposition to fight the Russians at Tannenberg. Napoleon studied the campaigns of Alexander the Great and Ghenghis Kahn, the Mongol. The navies draw their inspiration from the Battle at Actium in the time of the Romans, and the sea fight of Trafalgar. In the development of air power, one has to look ahead and not backward, and figure out what is going to happen, not too much what has happened. That is why the older services have been psychologically unfit to develop this new arm to the fullest extent practicable with the methods and means at hand."

219. *Memoirs*, 202. Mitchell compares this to aerial combat when he writes: "In the air, the action was entirely individual as far as combat was concerned. A man singled out his adversary and they engaged in mortal combat."

220. *Winged Defense*, 18. This is a continuation of the material in endnote 217.

221. *Memoirs*, 261. About the army's view of aviation Mitchell wrote on page 261-62: "We were experiencing a great deal of trouble with the ground troops in making them answer the signals from the air and properly maintaining their radio stations for communicating with our airplanes. . . . They did not even know what insignia on our planes was, in many cases."

222. "When the Air Raiders Come," 35. Mitchell had written on this point earlier in "Aeronautical Era," 103.

223. *Winged Defense*, 109-10. See also endnote 130 and its associated quote.

224. *Memoirs*, 6. Mitchell is referring to his observations of the trench warfare of World War I. In *Memoirs*, he recounts the vast loss of life experienced by both sides as troops were exposed to machine gun fire and gas warfare. Mitchell writes on page 76: "War on the ground is an obsolete system and improvement must come through the air."

225. *Ibid.*, 23. Mitchell refers to this on page 15: "It seemed to me that the utility of ground armies was rapidly falling to about zero, due to the great defensive power of modern firearms." The machine gun was perhaps the greatest contributor to the trench warfare that evolved, and the use of gas as a weapon of mass effect contributed significantly. Mitchell writes of this on page 23: "Every effort was made to shield the men from hostile machine-gun fire when they attempted an advance. Never had a more deadly instrument of war been invented than this

automatic weapon of destruction, the machine gun. . . . This was another indication of the great change that had taken place in ground warfare: no longer could men, unprotected by shield or gas mask, advance against a prepared position." Mitchell also comments on this idea on page 46: "What struck me most forcibly was the utter helplessness of the infantry when attacking over open ground, against modern machine gun and cannon."

226. *Memoirs*, 55. This idea was later termed blitzkrieg tactics during the next world war.

227. *Our Air Force*, 22. Mitchell writes on pages 22–23:

The old strategical reserves of Infantry troops moved about two and one-half miles an hour on the battlefield. If the enemy made a feint which drew in the main reserves to the fighting line, they could not be extricated in time to effect the decision. At the battle of Mukden, in the Manchurian War, the Japanese directed a very heavy attack against the Russian left, with a view to drawing their reserve in that direction, so as to attack the Russian right wing with their main forces. The Russian commander was deluded by this maneuver, and started his reserve for the left of his line. His front line was about 87 miles long. When the reserve approached the left of his line, the Japanese attacked his right. The reserve was turned and marched in the new direction, and after three days of marching it never reached its objective, and never entered the fight. A reserve of attack and bombardment airplanes could have covered this whole front in less than an hour. If a mistake had been made, they could have turned around in the air and applied in a new direction, and covered a hundred miles in the same time that troops on the ground would march two and one-half miles, or in one-sixth of the time that it would take to deploy an ordinary division of troops.

228. "Statement Regarding the Necessity of the Air Service," 12. The questioning has been the success of aircraft in combat. Mitchell has related his experiences from the battle at Montfaucon in the attack in the Argonne. Mr. Slemph poses the question: "You are substituting airplanes for something on the land or on the water?" Mitchell: "No, sir; I am saying we should first get control of the air, and then work directly in combination with whatever is on land or on the water to further the main object of the campaign. You ask me for a specific instance." Mr. Slemph: "I am trying to get a specific instance of the elimination of

this water or land material." Mitchell: "You will never eliminate the land forces entirely from the air, but you will greatly affect them." Mr. Slemp: "Not as against other air vessels." The questioning then moves to a discussion of operations against seacraft.

229. Our Air Force, 68. Mitchell also writes of this in *Memoirs* on page 128: "Therefore it is evident that no naval air force, no matter how transported, can hope to do anything against an air force based on shore. This is extremely important because if naval vessels cannot control the air over them, they cannot operate against shore establishments."

230. "Statement Regarding the Necessity of the Air Service," 14. The discussion is one on the necessity of aircraft or seacraft. Mr. Cramton: "In connection with that matter may I ask you this question? Is it not a fact that in England today the great issue, which has become a great popular issue, that is attracting great attention throughout the island, is the question of the reversal of their naval policy by reason of the possibility of attack from the air?" Mitchell: "Yes, sir." Mr. Cramton: "And a great section of those naval experts are insisting that the advantage of the capital ship is largely in the past by reason of the possibility of attack from the air?" Mitchell: "Yes, sir." Mr. Slemp: "They have their submarines, and that is an important feature." Mr. Cramton: "Certainly; they are considering attack from both directions." Mitchell: "We should demonstrate the matter conclusively as we go ahead, but we ought also to try to avoid mistakes by not getting too far behind. Eventually, you will find that, dollar for dollar spent, you will get more from an air force than from submarines, as an air force will both protect sea communications and destroy hostile vessels."

231. "How Should We Organize Our National Air Power," 6. Mitchell writes further: "They know that in the last war, surface ships—battleships, cruisers and other seacraft—took comparatively little active part except as transportation and patrol vessels. No battleship sank another battleship, and of the 134 warships sunk or destroyed during the war, the submarines sank sixty-two British warships and eight large French and Italian ships. No American battleship saw any fighting in the last war, not even those in European waters."

232. "Report of Bombing Maneuvers Conducted Off Cape Hatteras, 5 September 1923," 24. Refer to endnote 165 for a summary of this material.

233. *Ibid.*, 22. In the "Conclusions" section of the report, Mitchell writes:

1. Air Force, with the types of aircraft now in existence or in development, acting from shore bases, can find and destroy all classes of sea craft under war conditions, with a negligible loss to the aircraft. 2. Conditions of weather affecting air and sea conditions do not alter the statement made above, as aircraft can operate under conditions under which seacraft cannot operate. There are no conditions in which seacraft can operate efficiently in which aircraft cannot operate efficiently. For instance, sixty-mile wind, low visibility near the water, and operations at night are very difficult for seacraft. There are no conditions in which seacraft can operate efficiently in which aircraft cannot operate efficiently. Aircraft, therefore, form an absolutely positive system of defense against seacraft within the radius of their action.

234. *Ibid.*, 23. In the "Conclusions" section of the report, Mitchell writes: "3. Seacraft are much more vulnerable when they have steam up in their boilers, are moving at a high speed in formation, and when they are equipped with ammunition in their magazines and on their decks. A comparatively small bomb will cripple their condenser systems, throw their rudders and propellers out of line, and completely demoralize the operating personnel."

235. *Ibid.*, 23-24. In the "Conclusions" section of the report, Mitchell writes: "5. The problem of the destruction of seacraft by Air Force has been solved, and is finished. It is now necessary to provide an Air organization and a method of defending not only our coast cities, but our interior cities, against the attack of hostile air forces. Our recent maneuvers show that an enemy having control of the air—which gives him control of the sea—may land air forces from airplane carriers on any of the Islands or Keys along our coasts, which cannot be attacked by troops or artillery and from these points launch air attacks against our great centers of population in the triangle Bangor-Norfolk- Chicago."

236. "Billy Mitchell's Resignation Speech," 1. In his opening remarks, Mitchell is quoted as saying: "Command of our air forces in the World War and the privilege of directing the greatest concentration of allied air power ever participating in actual combat was entrusted to me. The sinking of battleships by aircraft projected and completed under my direction has revised and changed the system of national defense. Hostile navies are no menace to our country if there is adequate air power."

237. Our Air Force, 159. Mitchell writes on pages 159-60: "The characteristics of air power, in comparison with sea power, are, first, the predominant feature of speed which air power possesses. Navies move at the rate of 20 miles an hour, and may increase their speed about 30 per cent [sic] when going into action; airplanes move in large bodies at the rate of 100 miles an hour, or over. They fight at speeds of 150 miles an hour; while the fastest ones are approaching a rate of 200 miles an hour."

238. Ibid., 160-61. Mitchell concludes this statement with: "Our doctrine of Aviation, therefore, should be to find out where the hostile air force is; to concentrate on it on convergent lines, and destroy it; and then to attack the hostile shipping with aerial weapons, so as to accomplish its destruction."

239. Ibid., 163. Mitchell further explains:

At first the development of aviation over the water took place in a manner similar to that which had occurred on land; that is, merely as an auxiliary to navies, for the purpose of reconnoitering to tell where the enemy fleet, or enemy formations, were, for the adjustment of artillery fire, and for keeping track of parts of their own fleet. This, in theory, is a very simple matter—when no enemy is in the air to stop one's work. The airplanes could go out, find the enemy, report where he was by wireless, wait for the first shots to come from the cannon, tell their own fleet where they were striking, and proceed to adjust the fire in the ordinary way; that is reporting the position of each shot with respect to the target. When hostile Pursuit Aviation is encountered, however, this will all change.

240. Ibid., 168. In referring to the British aircraft carriers, Mitchell writes on page 169:

No other navy in the world is so equipped at the present time, and it is perfectly obvious that even with this comparatively crude equipment for handling air units over the water, the British can seize and hold command of the air in the vicinity of a fleet, and render a navy opposed to them not only totally blind—which is well known to be a decisive feature of modern warfare—but can also attack the opposing navy through the air with aerial weapons, so as to destroy it without the assistance of the gun fire of their ships. The air battle, in all probability, would take place from 50 to 200 miles away from the aircraft carriers, where hostile gun fire would play no part whatever, and where

their own navy would run no risk. It is, therefore, evident that floating airdromes must be made to suit the requirements of the airplanes first—that is, if we are going to fight and drive out of the air an opposing aviation, we must bring to bear against it airplanes that can do the work. Next, the airplane carriers must be able to defend themselves against attack on the water.

Mitchell then discusses the size and speed of the carrier.

241. "Air Service Tactical Application of Military Aeronautics," 12.

242. *Winged Defense*, 113. Mitchell writes: "Of equal importance is the question of the personnel, of the people who have to act and actually fly in aviation. We now have an air-going personnel as distinguished from a sea-going and land-going class."

243. "Our Army's Air Service," 8. In this staff paper under the section "Training the Aviator" Mitchell writes: "A man is not really capable of joining a squadron until he has had at least a year's instruction. Furthermore, a flying officer's education has to be progressive." Also see endnote 54 and its associated quote, also see endnote 244.

244. *Skyways*, 58. Although Mitchell writes that "Flying itself is the basis of all aeronautical information," he goes on to describe the many other factors required of pilots:

The highly developed aeronautical expert must not only have great vision for the future but must be a scientist and well versed in mathematics, mechanics, civil, mechanical and electrical engineering, aero-dynamics, chemistry, knowledge of metals, materials, strains and stresses on structures; navigation, both celestial and by the aid of radio; business and industrial organization and administration. The military airman, in addition to these things, has to be familiar with the operation and control of armies and navies; with civil, military and admiralty laws as applied to air traffic; with the systems of communication of countries, such as railroads, canals and steamship lines, also where food supplies and provisions are obtained, the location of the great cities and vital points of the country, so that in case of war he will know where and how to attack.

245. *Our Air Force*, 204. Mitchell continues: "After the fliers are graduated from the primary or pilots' schools, they should be

specialized in the particular kind of aviation that they are going into.”

246. *Our Army's Air Service*, 9.

The Army Air Service system contemplates a permanent nucleus of officers, a reserve sufficient to fill the regular and reserve cadres to war strength, and an educational system which contemplates the selection of suitable personnel, physically, mentally, and morally, for training as follows: The students first attend the pilots' schools, where flying training and elementary, disciplinary, and tactical air education are given. They are then sent to specialized schools for training in particular branch of aviation in which they are to serve—that is, pursuit, attack bombardment, or observation aviation. When the course [sic] (course) at the special schools is completed, they join their squadrons for service in the tactical units, where minor tactics and the use against the enemy of the branch of aviation in which the officer is serving are continued. Certain of those who have shown themselves most proficient are selected for training at the Field Officers' School, where the use of all branches of aviation in combination is taught, including the solution of air problems, plans of employment, operations, reconnaissance, bombardment, and the various branches of work in the Air Staff Departments—that is, operations, information, equipment, lighter-than-air, and administration. Beyond this, the officer's strategical education will be continued in existing schools and war colleges of the Army.

Also see the quote associated with endnote 247.

247. *Our Air Force*, 126. The complete text of this material is on pages 126–27:

When the young men [referring to those in attack aviation] have completed their courses in the special schools, they join their squadrons or actual air troops. After serving there for a period of two years and becoming entirely familiar with the tactics, supply, and handling of their organization, certain of those who have shown themselves the most proficient are selected for higher tactical education, and some for higher technical education. Those for a higher tactical education are sent to the Air Service School at

Langley Field on Chesapeake Bay. There they are taught how to handle all the air arms in combination, how to work with the ground troops, how to fight other air troops, navies, and ground troops—in other words, it is here that officers are given their education which combines all the different elements of aviation. Those chosen for a technical education are sent first to the School of the Engineering Division of the Air Service, which at present is at Dayton, Ohio. Upon graduation some are sent to the Massachusetts Institute of Technology or other technical institutions, which have engineering courses in aero dynamics [sic] and other technical matters pertaining to the construction and development of aircraft.

248. *Memoirs*, 22. Here Mitchell is referring to the training of the French pilots as contrasted with the training provided American pilots at the time. Mitchell expresses this as he describes the training of the French pilots: "Pilots were encouraged to do all the acrobatic flying possible, to keep their hand in. From what little flying I had done, I believed this to be correct. I saw many of the pilots returning, and all made some maneuver to break their speed as they approached the ground. Their flying appeared to me to be excellent."

249. "American Leadership in Aeronautics," 18. The complete text of this quote is:

The European War was only the kindergarten of aviation. It had machines that were just invented, the possibilities of their use were just beginning to be understood by the aviators themselves, while others looked on them as strange creations that were defying all known laws of science, of custom and of war. During the year 1918 American aviation received its baptism of fire in a terrific manner. Hurling into the midst of the Chateau-Thierry struggle, with the Allies shot out of the air, we had to evolve our own system and salvation as best we could. Untired by three long years of war, our men thought out many new ways of applying and handling air forces, so that when the Armistice came we had a fighting staff entirely conversant with the last-minute ways of making air power felt, and pilots that had fought the hardest battles, that knew every kink of the air fighting game, and knew they could defeat in single or combined combat any aviators of the world. In addition, we had handled the greatest combined force of

aviation ever brought under one command during our St. Mihiel and Argonne operations. When the question was agitated of consolidating the command of water, land and air under one direction on the Western Front for the campaign of 1918, it is probable that all sea forces would have been commanded by the British, all land forces by the French, and all air forces by the Americans. The power of aeronautical accomplishment was passing to the United States, and without a doubt it would have had the utmost influence in settling the war had it lasted another year.

250. Our Air Force, 76. Here Mitchell writes in the chapter "Observation Aviation." "This is done in two ways; first by visual reconnaissance, where the airplane goes out, looks over the ground, observes what is taking place there, and comes back and reports; and next, by photography." Also see endnotes 251 and 252.

251. "Air Service Tactical Application of Military Aeronautics," 5. Mitchell continues: "This branch of Aviation reconnoiters both by eye and by photograph, adjusts the fire of all sorts of missile throwing weapons and artillery, and affects liaison during combat between troops engaged in battle and the higher command when other means of communication become impossible to use." Also see endnotes 250 and 252.

252. Our Air Force, 78. Here Mitchell is writing in the chapter "Observation Aviation." He comments on page 80: "As a matter of fact, the adjustment of fire means a virtual command of the artillery from the air; as it lies in the hands of the observer to tell what kind of fire is having the most effect, what is the most dangerous target, and when the fire should begin and cease." Also see endnotes 250 and 251.

253. *Ibid.*, 85. Mitchell continues: "In other words, they pick up the object they are looking for, and remain in observation of it. This is an extremely difficult and hazardous task, and the fastest and highest flying planes have to be used for this purpose."

254. *Ibid.*, 88. Here Mitchell is referring to balloons; the reader may very well consider this statement in terms of satellites in modern military power.

255. *Ibid.*, 91. Although the reference to balloons is outdated, the reader is asked to consider this quote in terms of modern military power such as satellites and aerial platforms.

256. *Ibid.*, 20-21. Writing in the chapter "The Application of Air Power," Mitchell addresses the importance of communications and communications support.

257. *Ibid.*, 58. Here Mitchell is writing about the bombardment task in the chapter "Bombardment Aviation."

258. *Skyways*, 271. Mitchell is writing here in the chapter "The Use of Aircraft in the War."

259. *Our Air Force*, 69. Writing in the chapter "Attack Aviation," Mitchell continues:

It is especially developed to scatter and retard advancing columns of troops and tanks, artillery; to wreck deployments of troops; to attack machine-gun nests, hostile airdromes, and anything that it is capable of getting at. . . . The tactics of this Arm of the Service are to determine where the hostile element to be attacked is found; then to go there at very low altitude, one or two hundred feet above the ground, utilizing whatever concealment offers itself in the way of woods, high banks, hills, mountains, smoke clouds, or screens of other airplanes. The attack is made with suddenness and with every element of surprise possible.

260. *Memoirs*, 298. In examining German aircraft after the war, Mitchell was commenting on the German Junkers attack aircraft. He writes: "On one airdrome there were about a dozen Junkers—all metal armored airplanes—which had just come up from the front. The pilot's and observer's places and the engine parts were covered by armor, which would protect them from the fire of small arms. They intended to attack the reserves on the road with these."

261. "Air Service Tactical Application of Military Aeronautics," 5. Mitchell continues: "These airplanes fly at very low altitudes, and are armored to resist ordinary rifle, machine gun, and shrapnel fire. They are almost flying tanks. They are organized into Squadrons, Groups, and Wings, in a manner similar to Bombardment and Pursuit Aviation." In *Our Air Force*, page 125, Mitchell writes: "This class of aircraft is particularly efficient against tanks on the ground—in fact, only a few days ago, in some tests that I was having conducted at a target of a tank, out of eight shots fired by an attack airplane five hit the target directly. Any one of these shots would have put the tank out of action. The effect of fire from machine guns carried by these attack planes is tremendous, and will be a decisive element in future battles."

262. *Our Air Force*, 125. Mitchell continues to write: "and the student officers are taught the interdependence of these two branches of aviation."

263. "Awake America," Aero Digest, July 1926, 7. Published shortly after his court-martial, these are the opening words of the article. Mitchell concludes the article with:

This system must be changed, it has become a national cancer. We must have a single department of National Defense with sub-heads for the Air, Land, Water and Munitions. We must have a single directing head and a single staff to handle all major defense questions. Until this is done we shall continue to lean on a broken reed and should the call come to defend this great country we shall find ourselves even more defenseless than we were at the beginning of the Civil War or the World War. Intelligent public opinion reflected in laws enacted by Congress is the only remedy.