

EARNING THEIR WINGS: ACCIDENTS AND FATALITIES IN THE UNITED STATES  
ARMY AIR FORCES DURING FLIGHT TRAINING IN WORLD WAR TWO

by

MARLYN R. PIERCE

B.A., University of Houston, 1983  
M.A., University of Louisville, 1994  
MMAS, US Army Command and General Staff College, 1998

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of History  
College of Arts and Sciences

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

2013

## **Abstract**

This study analyzes the effect of the Army Air Forces' wartime experience on the selection and training of aviation cadets and the steps taken by the Army Air Forces to reduce the number of accidents and fatalities. Over the course of the war, the US Army Air Forces suffered over 54,000 accidents in the continental United States. These accidents accounted for over 15,000 fatalities, the equivalent of a World War Two infantry division. As a result of this wartime experience the Army Air Forces began instituting and enforcing stricter safety measures and emphasizing safety in all phases of training. By the end of the war, the Army Air Forces had transitioned from an organization with loose standards for selection, training, and safety to one with formal procedures for all three. In the process, the Army Air Forces established a new culture of professionalism for the US Air Force.

EARNING THEIR WINGS: ACCIDENTS AND FATALITIES IN THE UNITED STATES  
ARMY AIR FORCE DURING FLIGHT TRAINING WORLD WAR TWO

by

MARLYN R. PIERCE

B.A. University of Houston, 1983  
M.A. University of Louisville, 1994  
MMAS, US Army Command and General Staff College, 1998

A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of History  
College of Arts and Sciences

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

2013

Approved by:

Major Professor  
Donald J. Mrozek

# **Copyright**

MARLYN R. PIERCE

2013

## **Abstract**

This study analyzes the effect of the Army Air Forces' wartime experience on the selection and training of aviation cadets and the steps taken by the Army Air Forces to reduce the number of accidents and fatalities. Over the course of the war, the US Army Air Forces suffered over 54,000 accidents in the continental United States. These accidents accounted for over 15,000 fatalities, the equivalent of a World War Two infantry division. As a result of this wartime experience the Army Air Forces began instituting and enforcing stricter safety measures and emphasizing safety in all phases of training. By the end of the war, the Army Air Forces had transitioned from an organization with loose standards for selection, training, and safety to one with formal procedures for all three. In the process, the Army Air Forces established a new culture of professionalism for the US Air Force.

## Table of Contents

List of Tables .....	vii
Acknowledgements.....	viii
Dedication.....	ix
Preface.....	x
Chapter 1 - Introduction.....	1
Chapter 2 - Culture of Risk.....	14
Chapter 3 - Selecting the Aircrews .....	48
Chapter 4 - Training the Aircrews .....	78
Chapter 5 - The Accidents: Causes and Prevention.....	140
Chapter 6 - Conclusion .....	198
Bibliography .....	211
Appendix A - Tables.....	228

## List of Tables

Table 1. Aircraft Production by Type and Year.....	228
Table 2. US Army Air Forces Personnel — Number and Percent of US Army Strength: 1930 – 1945.....	229
Table 3. US Army Air Forces Training Facilities by Function and Year.....	230
Table 4. Aircraft Accidents — Number and Rate: Fiscal Year 1936 – 1945.....	231
Table 5. Airplane Accidents in Flight Training.....	232
Table 6. Airplane Accidents in Transition Flight Training: 1942 – 1945 (primary models only).....	232

## **Acknowledgements**

I want to thank the members of my committee: Dr. Donald Mrozek, Dr. Sue Zschoche, Dr. Dale Herspring, and Dr. Jane Fishback, all of Kansas State University and Dr. Chris Gabel of the US Army Command and General Staff College (CGSC), for their diligence and patience in guiding me through this process. I would also like to thank the many archivists and librarians for their assisted me in my research. In particular, Ms. Lynn Gamma from the US Air Force Historical Research Agency, Maxwell AFB, Alabama, and Mr. Mike Browne from the Combined Arms Research Library, Fort Leavenworth, Kansas. Special thanks go to the Director of the Department of Military History at CGSC, Dr. James Willbanks, for providing me the opportunity to write and research and the department's editor, Ms. Sue Rosell for answering my myriad of editorial questions. My most heartfelt appreciation goes to my wife Gwynn and my children, Heather, Matthew, and Phillip, for their patience, support and understanding whenever I had "work" to do.



# **Dedication**

To the 15,530.

## Preface

On 7 May 1945, Victory in Europe (VE) Day, the United States Army Air Forces (USAAF) lost five airmen and two aircraft in two fatal accidents. While the country celebrated the defeat of Nazi Germany, the need for qualified aircrew, while declining, did not cease. It should also be noted that VE Day, when it came to accidents, was not an average day for the Army Air Forces: it was below average. Throughout the war, the Army Air Forces suffered over 6,500 fatal accidents in the continental United States resulting in the loss of 7,114 airplanes and the death of 15,530 personnel.<sup>1</sup> This was an average of ten deaths and nearly 40 accidents, fatal and non-fatal, a day. The Army Air Forces reached its peak for both training and accidents in 1943. That year the Army Air Forces suffered 2,268 fatal accidents that resulted in over 5,600 fatalities and over 2,500 aircraft damaged or destroyed.<sup>2</sup> The situation was better in 1944 with a 14 percent drop in accidents compared with 1943.<sup>3</sup> However, there were still nearly 2,000 fatal accidents and the death of 5,000 pilots and crew.<sup>4</sup>

Some of these accidents were due to pilot error, such as poor navigation and piloting skills, or even, to be blunt, stupidity, such as showing off for sweethearts or family, who were forced to watch in horror as their loved ones died in horrible accidents. Numerous accidents were the result of inattention by the ground crew in performing their maintenance tasks. In addition,

---

<sup>1</sup> Anthony J. Mireles, *Fatal Army Air Forces Aviation Accidents in the United States, 1941-1945* (Jefferson NC: McFarland, 2006), xi.

<sup>2</sup> *Ibid.*, xi.

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

<sup>4</sup> *Ibid.*, xi.

the blame for other accidents could be laid upon poor decisions in aircraft design that made some airplanes difficult to fly, especially for the rapidly-trained wartime pilots. Whatever the cause of these accidents, once the United States entered World War Two, the USAAF had to produce an ever-increasing number of pilots in the first half of the war. Nonetheless, the Army Air Forces, rather counterintuitively, began to place more emphasis on safety during this period of rapid expansion.

In 1938, President Roosevelt had called for the production of 10,000 aircraft annually; by 1940, with an eye on events in Europe, he had increased that number to 50,000 — a difficult task to be sure, but it could be accomplished by increasing the budget of the Air Corps for procurement and training. On the other hand, Roosevelt’s mandate would also require an expansion of the industrial base. This task was made easier by the fact that aircraft technology, at the time, was not so advanced as to be beyond the capability of the general manufacturing base of the United States. The more daunting task facing Major General Henry H. Arnold, Chief of the Air Corps and the General Headquarters Air Force Staff, would be to produce the aircrews to operate those planes. The Air Corps had always been selective in admitting cadets into the flight program and the pace of the prewar Air Corps had made flight training highly individualistic. However, the proposed expansion forced Arnold and his staff to evaluate both selection and training.

Throughout the interwar period the Army Air Service, later Army Air Corps, and finally, in June 1941, Army Air Forces, adopted some “leisurely practices” in light of the war.<sup>5</sup> The three phases of flight training — primary, basic, and advanced— were divided into three twelve-week

---

<sup>5</sup> Cameron, Rebecca Hancock, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Office of Air Force History, 1999), 371.

courses. Each phase of training was reduced to ten weeks just prior to the United States' entry into the war and further reduced to nine once the United States entered the war. In addition, even though the Air Corps, initially, had first call on personnel raised by the draft, there was some relaxing of the minimum requirements for entering training, such as replacing the requirement for two years of college with an entrance exam. Anticipating a 40 percent failure rate in flight training, the Air Corps Staff believed that the changes in the standards were necessary to insure an adequate pool of cadets. In addition, with more planes coming off the assembly line, the Air Corps would have to graduate more pilots meaning it would also have to recruit more young men for flight training. The question then arises: What was the cumulative effect of these actions on training and safety in the Army Air Forces?

There have been scores of studies, books, and memoirs on the Army Air Forces in World War II. However, most give training a brief mention, if any at all, before rushing into the glories and trials of aerial combat. This study is an attempt to analyze the preparation of these men and, in many cases, boys for combat.<sup>6</sup> In particular, what effects did training losses have on policies and procedures within the Army Air Forces? Can these losses be attributed to the rapid expansion of the force in order to meet the wartime emergency? Did the chain of command ever voice concern over these losses or were they considered "acceptable losses" brought about by an extraordinary situation? What effect did reports from the field have on the training program? Did the experience of combat inject new, and perhaps more hazardous, training requirements? A higher accident rate was to be expected in primary flight training, the first stage of flight training, however it was even higher in advanced flight training, the phase before a pilot began

---

<sup>6</sup> One 22-year-old B-17 pilot recalled that his crew ranged in age from 18 to 28. Eugene Fletcher, *Mister: The Training of an Aviation Cadet in World War II* (Seattle WA: University of Washington Press, 1992), 200.

transition training into the aircraft he would fly in combat (See Table 5). However, the *fatality* rate increased as the cadets progressed through training. In addition, the greatest number of fatalities occurred during transition flight training, the last training stage before the pilot or crew deployed to a group or squadron (See Table 6). Was this due to the difference in the performance characteristics of the aircraft or was it due to a more rigorous program of instruction (POI) when the pilots entered the last phase of training before being posted to an operational unit? Another possibility for the increase in fatalities during this phase of flight training might have been overconfidence on the part of the pilot. By this phase each had survived a grueling process and were becoming masters of their profession. This often times led them to overestimate their ability and take unnecessary risks.

Another aspect of this study is to place the experience of the US Army Air Forces within the framework of organizational culture. The military is a distinct culture within the society it represents and each branch of service possesses a unique subculture. The culture of the Army Air Forces' revolved around flying, and flying is an inherently risky business. A brief review of societal views on safety, at the time, can provide insights into how outside influences might effect an organization such as the Army Air Corps. In the Army Air Forces' case, did the interwar culture make wartime fatalities more palatable?

The pre-World War Two generation of pilots had grown up in the infancy of aviation, a generation that included such men as "Hap" Arnold, who took ground instruction from Orville Wright. In addition, every new advance in aviation technology brought some degree of risk. It was part-and-parcel of the profession; deaths were inevitable. At times in Air Force history, this was truer for training and peacetime than for combat. For example, during World War One two

cadets were killed in training for every combat death.<sup>7</sup> In another example, during the brief period from 16 February to 8 May 1934 the Air Corps, because of a political crisis, took over airmail delivery from the airlines. During those 78 days, the Air Corps suffered 66 accidents that resulted in the death of 12 pilots not to mention a completion rate of less than 6 percent, meaning that less than 6 percent of the planes and their cargo reached the intended destination intact and on time.<sup>8</sup> While the airmail fiasco, as it came to be known in some circles, made front-page news and brought new attention to the Air Corps' safety record, the Air Staff could not anticipate the scrutiny that training fatalities would bring once the expansion for World War Two began.

In April 1942, Arnold was called before Congress to discuss the rise in non-combat related accidents and fatalities in the USAAF. A staff officer sent Arnold a memo suggesting that the "alleged" high accident rate might not be borne out by the data. He assured Arnold that the data would indicate a decrease in the accident rate when compared with prewar rates. Based on prewar experience, Arnold's assistant was suggesting that if the loss numbers approximated the prewar figures then they would be "acceptable."<sup>9</sup> This suggests that the close-knit and exclusive culture of the pre-World War Two Air Corps, composed of men such as Arnold, Eaker, and Spaatz, had accepted that fatalities were inevitable and that a certain number were considered acceptable. On the other hand, the prewar Air Corps had never had to deal with the scale of the fatalities and accidents it faced as its training operation expanded. Over the course of the interwar period the average number of fatalities was 51 per year. Between 1942 and 1945, the

---

<sup>7</sup> Weekly News Letter from the Secretary of War, 7 Dec 1918.

<sup>8</sup> Shiner, John F., "Foulois: In the Beginning," in *Makers of the United States Air Force*, Frisbee, John L., ed, (Washington DC, Office of Air Force History, 1987), 30-31.

<sup>9</sup>Routing and Record Sheet 1942 4-9 from Colonel Dunn to General Arnold. Subject: High Accident Rate in the Army Air Forces. RE: Upcoming congressional investigation into aircraft accidents.

average was 3,675.<sup>10</sup> Coupled with both private and Congressional concerns over the number of accidents, the Army Air Forces began taking steps to address the safety problem. One of the Air Staff's first actions was the establishment of the Office of Flying Safety in April 1942 although funding and staffing would be an ongoing issue for this organization. The office produced cartoons, films, posters, pamphlets to educate Army Air Forces personnel about safety. By May 1943, the monthly history of the Office of Flying Safety was fairly gushing about its efforts and successes.<sup>11</sup>

At other times, the actions of the Army Air Forces staff leave the impression that they were deliberately trying to obfuscate the number of training fatalities. The best example is from the *Army Air Forces Statistical Digest*. Published in December 1945, the digest details every facet of operations that could be quantified, from number of missions flown to the number of .50 caliber machine gun rounds expended by theater, in one table after another. However, somewhat surprisingly, the *Statistical Digest* combines training fatalities and eliminations in one entry.<sup>12</sup> One callous interpretation of this conflation of these two experiences that had radically different effects on the cadets is that in either case, fatality or elimination, they were all the same — a loss to the Army Air Forces. Another possibility is that the actual number of training fatalities was potentially embarrassing to the USAAF. Death in combat is tragic but can be justified, and sometimes even honored; death in training is tragic as well but raises the question: Why? The perception of training, among most participants, is that it is a "safe" or at least a controlled environment where accidents occur but where steps are taken to reduce them. In this light, the

---

<sup>10</sup> United States Army Air Forces, Office of Statistical Control, *Army Air Forces Statistical Digest: World War II* (Washington DC: Office of Statistical Control, 1945), 308.

<sup>11</sup> History of the AAF Office of Flying Safety for the Month of December 1943.

<sup>12</sup> United States Army Air Forces, Office of Statistical Control, *Army Air Forces Statistical Digest: World War II* (Washington DC: Office of Statistical Control, 1945), 66-67.

Army Air Forces safety program not only expanded, it also, in the process, became more bureaucratic. For example, by the end of the war, the procedures for reporting and investigating accidents had become codified in stricter regulations, multi-form reports and numerous safety inspections.

Flight training and safety in the Army Air Forces during World War Two is a relatively open topic. Most secondary studies of the interwar Air Corps and the wartime Army Air Forces focus on combat operations, development of doctrine, or personalities. Those about flight training and safety are very few. The most recent study is *Training to Fly, Military Flight Training, 1907–1945* by Rebecca Hancock Cameron. Published by the Air Force History Museums Program in 1999, Cameron’s work discusses much of the bureaucracy and politics of flight training during the period and even delves into the mechanics of training and selection. However, there is not much analysis. More recently, in 2006, Anthony Mireles published a three-volume compilation of every accident report involving a fatality from 1941 through 1945.<sup>13</sup> This monumental work is an outstanding one-source reference for the who, what, when and where of flight accidents. However, once again, there is not much analysis.

There are a few sources on one of the more controversial flight training programs, the Civilian Pilot Training Program. The CPTP was a New Deal program intended to provide a pool of ready pilots for the Army and Navy and to give a boost to the civilian light aviation industry. General Arnold, as Chief of the Army Air Forces, never truly embraced the program. The most recent works on this topic are *To Fill the Skies with Planes: The Civilian Pilot Training Program, 1939–46* and *Embry–Riddle at War: Aviation Training during WWII*. The former is a

---

<sup>13</sup> Anthony J. Mireles, *Fatal Army Air Forces Aviation Accidents in the United States, 1941-1945* (Jefferson NC: McFarland, 2006), 1306.



general history of the CPTP program while the latter focuses on one contractor, albeit the largest and most successful, for primary flight training. An older source is a Federal Aviation Administration (FAA) booklet, *The Putt-Putt Air Force*, first published in 1971. However, these works, the latter in particular, do not delve deeply into the effect of accidents, fatalities, and safety on the Army Air Forces flight-training program and the aircrews undergoing flight training.

On the other hand, there are numerous biographies and memoirs by the cadets, the instructors, and the senior officers involved in the flight-training program. These works, such as Eugene Fletcher's *Mister: The Training of an Aviation Cadet in World War II* and Charles A. Watry's *Washout! The Aviation Cadet Story* recall the personal experiences of those undergoing training and shed light on the effect of Army Air Forces' policies at the individual level. In addition, these recollections are invaluable for assessing the attitude of the participants to flight safety and specifically the effect of fatalities on those who survived. For instance, Chuck Yeager in *Yeager: An Autobiography* believed the process merely weeded out the "weak sisters."<sup>14</sup> In addition, during the 1960s and 1970s the Air Force began an oral history program to capture the experiences of the general officers who began their careers during the period under study in this work. Of course, memories fade, nor can these interviews be any better than the questions of the interviewer, but they are still a valuable source for gaining the perspective and opinions of the participants.

The United States Army Air Forces went from a small close-knit "club," in the words of Curtis LeMay, accustomed to forty-eight fatalities a year, to a safety conscious organization that averaged forty-eight fatalities in five days of training. This study will be an attempt to analyze

---

<sup>14</sup> Yeager, Chuck and Leo Janos, *Yeager: An Autobiography*, (New York: Bantam Books, 1986), 15.

the process of flight training as the Army Air Force transitioned from a culture of risk to one of safety.

## Chapter 1 - Introduction

If sufficient experience could have been gained prior to wartime expansion, therefore, it is conceivable that accident rates could have been reduced sooner, thereby eliminating many of the accidents occurring in the early months of trial and error.<sup>15</sup>

*Safety as a Factor in the Future of Aviation.*

On 1 September 1939, the Air Corps consisted of 26,500 men and 2,200 aircraft.<sup>16</sup> At its peak in July 1944, the USAAF possessed nearly 80,000 aircraft and ended the war with a personnel strength of 2,250,000 (Tables 1 and 2).<sup>17</sup> Between 1939 and 1945, nearly 200,000 pilots graduated from the Army Air Forces flight-training program.<sup>18</sup> The program reached its peak in December 1943 with over 74,000 students in various stages of flight training.<sup>19</sup> During the same period, 124,000 or almost 40 percent of those who entered training failed to earn their wings.<sup>20</sup> This number includes the fatalities that resulted from training accidents. As was to be expected, the accident rate went down as cadets progressed through primary, basic, and advanced flight training. Paradoxically, the fatality rate went up; 439 cadets were killed during primary flight training, over 1,100 during basic flight training, and nearly 2,000 during advanced flight

---

<sup>15</sup> United States Army Air Forces, Office of Flying Safety, *Safety as a Factor in the Future of Aviation* (Washington DC: Chamber of Commerce of the United States of America, 1946), 17.

<sup>16</sup> Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington DC: Office of Air Force History, U.S. Air Force, 1987), 446.

<sup>17</sup> United States Army Air Forces, Office of Statistical Control, *Army Air Forces Statistical Digest: World War II* (Washington DC: Office of Statistical Control, 1945), 46-47.

<sup>18</sup> *Ibid.*, 46-47.

<sup>19</sup> *Ibid.*, 46-47.

<sup>20</sup> *Ibid.*, 46-47.

training.<sup>21</sup> This difference can be attributed to various factors such as overconfidence on the part of the pilots as they became more proficient or, in other cases, because they were flying faster and more complex aircraft by the end of their training.

Fatalities and accidents were not unknown in the prewar Army Air Corps; however, the expansion in 1939 brought the issue to the forefront. As General Henry H. Arnold, Chief of the Army Air Forces during World War Two, noted in his 1945 annual report to the Secretary of War:

Twenty years' accumulation of experience, by a comparatively small and fixed group of men, brought the AAF accident rate down to 51 per 100,000 hours in 1940. Expansion introduced a new and enormous block of inexperience, which would tend to reproduce the situation of the early 'Twenties. Vigorous preventive measures were taken against the expected rise. The degree of success can be measured by the fact that the accident rate has been held down and new all-time lows attained.<sup>22</sup>

The "vigorous preventative measures" Arnold referred to resulted from the prewar Army Air Corps transitioning from a "small and fixed group of men" comfortable with a more open approach to training and accidents to the rigid bureaucratic organization that the Army Air Forces became as a result of its wartime experience.

It is often stated that militaries reflect the societies that produce them and the Air Corps was no different. In particular, there were changes in American society that affected attitudes

---

<sup>21</sup> Anthony J. Mireles, *Fatal Army Air Forces Aviation Accidents in the United States, 1941-1945* (Jefferson NC: McFarland, 2006), xi.

<sup>22</sup> United States Army Air Forces and Henry Harley Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War* (Washington DC: US GPO, 1944).

toward safety and concerns over risk. For the first three decades of the twentieth century, much of the social change in society was driven by new technologies, such as the automobile. As more and more cars took to the roads, there was an increase in the awareness of issues affecting safety and a call for standardization in equipment and procedures from the public and the politicians. For example, in 1923 the governor of New York, in light of “the alarming increase of automobile accidents,” lent his endorsement to the goals of the newly established Safety First League.<sup>23</sup> The purpose of the league was to make people aware of the increasing accident rate and to prescribe measures to address the problem. The governor further attributed the increase in accidents “to the careless operation of automobiles and a lack of central control and supervision of licensing and regulation of automobile traffic.”<sup>24</sup> The next year a National Safety Conference was held in Washington DC.<sup>25</sup> Meanwhile, in New York, 400,000 drivers signed pledges to “observe courtesy and carefulness” while driving.<sup>26</sup> In addition, the Committee on Traffic Control drew up “concrete resolutions as standard rules governing the conduct of travelers on the highway; uniform speed regulation, aimed primarily at reckless driving, and examination and licensing of all motor vehicle operators . . . .”<sup>27</sup> On the other hand, the Air Service and Air Corps faced different challenges than the population in general. The average driver was not expected to personally test out any advance in automobile technology but that was exactly what was expected of the average Air Corps pilot. However, by the end of World War Two, the Army Air Forces would use many of the same measures as had been proposed by the public safety advocates in discussing automobiles and their use.

---

<sup>23</sup> *New York Times*, 16 April 1923.

<sup>24</sup> *Ibid.*

<sup>25</sup> *New York Times*, 23 November 1924.

<sup>26</sup> *Ibid.*

<sup>27</sup> *Ibid.*

The Air Corps pilots did not shrink from their responsibilities and, in many cases, they sought out the challenges presented in the early days of aviation. In the process of testing and advancing the boundaries of aviation, many of these pilots set altitude, distance, and speed records and accomplished numerous “firsts” in the field of aviation. At the same time, the interwar pilots were establishing the cultural norms for the Air Corps. Even though the pilots of the interwar Air Corps accepted the risks inherent in flying, they were not reckless men. They took the precautions necessary to make their flights as safe as possible; however, they did not let those factors stop them from trying. On the other hand, they were not above attempting stunts, such as wing walking, because they *could* attempt them and, usually, without fear of recrimination.

Because of their exploits, the pilots began to see themselves as part of an exclusive club made even more exclusive because they were few in number. Their “club” was kept small by both funding and the strict requirements set for acceptance into pilot training. The biggest obstacle was the education requirement. Each applicant had to have at least two years of college education. Then the prospective pilot had to pass a demanding physical exam. Having passed through those gates the new aviation cadet still faced the daunting task of making it through flight training. Between 1923 and 1938, only 10 percent of qualified applicants graduated from pilot training and earned their wings.<sup>28</sup> This situation would change in 1939 as the Air Corps began to expand with many politicians and military leaders anticipating the United States entering World War II.

---

<sup>28</sup> United States Army Air Forces, Office of Statistical Control, *Army Air Forces Statistical Digest: World War II* (Washington DC: Office of Statistical Control, 1945), 313.

Faced with the challenge of rapidly expanding the Air Corps, the senior leaders, such as Arnold, believed that the selection process would have to be streamlined. By 1941, despite his misgivings, Arnold had agreed to forego the college requirement for a standardized test to screen applicants. In addition, the Air Staff understood that not everyone would complete the rigorous training, so they had to recruit with attrition in mind. For example, a 1943 report from Air Training Command to the Commanding General Army Air Forces concluded:

. . . to meet training requirements for heavy bomber crew production, it [the Air Staff] anticipated elimination rates in pilot training would be 31 percent in primary, 13 percent in basic, and 2 percent in advanced. The elimination rate in navigation would be approximately 15 percent, and in bombardiers, 20 percent.<sup>29</sup>

This estimate was not far off the final numbers. The official history recorded that the “washout” rate for pilots was 40 percent, 20 percent for navigators, and 12 percent for bombardiers.<sup>30</sup> The problem for the Air Corps was how to select only the best for flight training knowing that nearly half would not complete training.

By replacing the college requirement with a standardized test, the Air Corps gave a number of young men who could not afford college the opportunity to become pilots. In addition, the Air Corps expanded its program of recruiting enlisted men to be pilots, Chuck

---

<sup>29</sup> Report from Headquarters Army Air Force Training Command to Commanding General Army Air Forces, 5 Oct 1943. Quoted in Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Air Force History and Museums Programs, 1999), 667.

<sup>30</sup> Wesley Frank Craven et al., *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1983; 1948), 589. The phrase “washout” was used by both Navy and Army aviation cadets to describe those who were eliminated from flight training. To one Navy cadet the word “sounded as though you turned colorless and just faded away.” Samuel Lynn Hynes, *Flights of Passage: Reflections of a World War II Aviator* (Annapolis MD: F.C. Beil; Naval Institute Press, 1988), 16.

Yeager being one of the most notable to make this transition. Many of the pilots and the public in general welcomed this change, noting that education was not necessarily a good indicator of flying ability. For example, the *New York Daily News* ran an editorial under the heading “Rickenbacker Didn’t Go To College.”<sup>31</sup> The editorial concluded:

The possibility that we may pick up some pilots who don’t know a cosine for a dodecahedron . . . is of minor importance. We bet there are a lot of taxicab drivers who could be turned into swell combat pilots.<sup>32</sup>

On the other hand, the primary reason for washing out, particularly in the preflight phase of training, was academics. To remedy this deficiency the Air Corps began sending cadets who had passed the initial screening exam but were still weak in some areas to colleges and universities for classes to make up for these deficiencies. For example, one cadet noted that the test showed him to be weak in physics, English, and history, and he was sent, along with a group of others, to a small university for remedial classes.<sup>33</sup>

The one area on which the Air Corps refused to bend was physical condition. For example, even though the Air Corps agreed to accept cadets from the Civilian Pilot Training Program (CPTP), the Air Staff insisted that CPTP candidates had to pass the standard Air Corps physical. The majority of applicants for flight training, regardless of source, were rejected because they could not pass the physical. Many of those who completed flight training have noted in their postwar memoirs that the physical exam was the toughest part of the screening process. Most of the applicants had never endured such a thorough examination. One also noted that, as he was being poked and probed, it was one of the “most humiliating experiences” of his

---

<sup>31</sup> Charles A. Watry, *Washout!: The Aviation Cadet Story*, 1st ed. (Carlsbad CA: California Aero Press, 1983), 9.

<sup>32</sup> Quoted in *ibid*, 9.

<sup>33</sup> *Ibid.*, 32.



life.<sup>34</sup> On the other hand, physical fitness, such as running, was not tested. However, motor skills were tested. This test consisted of various challenges in manual dexterity and problem solving. Most of the cadets noted that portions of this test were both difficult and baffling. One cadet insisted that these “diabolical” tests were designed so that no one could ever get a perfect score.<sup>35</sup>

The psychological evaluation, according to the pilots, was the next hardest part of the screening process. Most noted that they could accept being rejected for failing the written or physical exams, but they believed it would be unfair to be denied the opportunity to become pilots because they gave the wrong answer to some trick question. For example, Eugene Fletcher stated after the war:

They [the motor skills tests] were fun because it was man against the machine or the mechanical elements, but the mental tests were a little scary. After all, who wants to tell some sinister stranger what he sees in ink blobs . . . . We all wanted to fly and we surely didn't want to lose this opportunity just because an ink blob might look like spilled ink, a naked lady, or some other screwy imagined image or hallucination.<sup>36</sup>

After nine weeks of being tested, examined, and indoctrinated to army life, the cadets were ready to begin flight training. Ahead of them, the cadets faced 30 to 40 weeks of intense instruction both on the ground and in the air. Accompanying them was the fear that any mistake could lead to them being washed out.

---

<sup>34</sup> Eugene Fletcher, *Mister: The Training of an Aviation Cadet in World War II* (Seattle WA: University of Washington Press, 1992), 22.

<sup>35</sup> Watry, *Washout!: The Aviation Cadet Story*, 50.

<sup>36</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 22.

In primary flight training, the cadet was introduced to flying, typically, in a light civilian aircraft such as a Piper Cub. Because the Army could not provide enough aircraft or instructors, the cadet underwent flight training at a civilian flight school contracted by the Army, the Embry-Riddle school in Florida being the most notable. The contract instructors were of varying backgrounds and qualifications to be flight instructors. Some were former military pilots; others were itinerant barnstormers. Regardless of their background the majority made the transition to military flight instructor and earned the respect of their charges. In nearly every memoir, the former cadets praised their primary flight instructors for encouraging them and setting them up for success in their subsequent flying career. For example, after the war, one cadet said of his first instructor, “My new instructor was just out of flying school and a swell guy. We immediately developed a good rapport . . . [and] he was determined to prove that he was a good instructor, just as I was trying to prove that I could be a good student.”<sup>37</sup> On the other hand, there were cadets who were not impressed with their instructors and questioned if they should have been near cadets. Such was the experience of one cadet who, after the war, recalled his instructor, who was a veteran of the Doolittle raid: “[i]t may be that his harrowing experiences on that raid caused him to be jumpy, and maybe he should have been doing some other kind of flying other than instructing green cadets.”<sup>38</sup>

The Air Corps was also short of ground instructors who were to present not only the theoretical aspects of flying but also the practical skills, such as navigation and meteorology, necessary to fly an airplane. The majority of these instructors were recruited from colleges and universities, men such as Professor Alfred R. Lindesmith, a sociologist at Indiana University,

---

<sup>37</sup> Ibid., 71.

<sup>38</sup> Watry, *Washout!: The Aviation Cadet Story*, 127.

who was a pioneer in the study and treatment of addictions. However, it was not always easy for these instructors to transition from the open academic environment of the university to the often-rigid model of military instruction. Lindesmith, in a postwar article, complained that he felt that these instructors had been underutilized.<sup>39</sup>

Basic and advanced flight training were run entirely by the Army Air Forces. In these phases, the cadet was introduced to a faster and more complex airplane and some cadets could not make the transition and were eliminated. For the rest the training became more intense involving such training as long-distance flights at night that challenged the cadet's skill at navigation. The cadets were also introduced to more sophisticated aerial maneuvers that would become critical to their survival in combat.

The instructors in basic and advanced flight training were all Army Air Forces pilots of varying levels of experience. Often, in the early part of the war, the instructors were themselves recent graduates of the flight program. Later, the majority of them were combat veterans. This situation brought its own set of problems as many of the returning pilots were not necessarily suited to teach others how to fly. This was a problem the Army Air Force had not anticipated and was not rectified until the Air Staff established criteria for screening returning pilots before assigning them to duty as flight instructors.

Prior to the war, the Air Corps had not given much thought to the training of navigators, bombardiers, or aerial gunners. It was the policy in the Air Corps that these were additional skills that a trained pilot or mechanic could pick up on the job. However, as the Air Corps expanded, the Air Staff came to realize that these positions would require specialized training.

---

<sup>39</sup> Alfred R. Lindesmith, "Teachers in the Army Air Forces," *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946), pp. 404-407.

Initially, the Air Corps assigned “washed-out” pilots to navigator or bombardier school. However, this presented a morale problem for the Air Corps as the washed-out pilots often resented being reclassified to what was assumed to be a lesser position. As it gathered more data on the validity of its screening criteria, the Air Corps eventually refined its testing methods to screen for those applicants who would make better navigators or bombardiers than pilots.

At the completion of advanced flight training, the cadet, regardless of his specialty, received both his wings and his commission as a Second Lieutenant in the Army Air Forces. The new pilot’s final phase of flight training was his transition to the plane he would fly in combat. These aircraft were the fastest and most complex aircraft in the Army Air Forces. This was also the phase in which the pilot was at his peak in training and confidence. He had survived a very grueling process and was about to become a combat pilot. By the time he reached this point in his training the cadet had seen up to nearly half of the class that began flight training with him eliminated through academic failure, lack of flying ability, or death. For example, Class 44B, Charles Watry’s class, began with 4,931 cadets in preflight, and 2,966 completed advanced flight training.<sup>40</sup>

Accidents have always been part of the Air Force experience. However, the senior officers of the Army Air Forces had never experienced the level of accidents as they witnessed during World War Two. Prompted by both external and internal pressure the Army Air Forces began an extensive program to investigate not only the causes of these accidents but also what steps could be taken to prevent similar accidents in the future.

The causes of the accidents ranged from poor aircraft design to pilot error. The former also included innovative design. Often, the aircraft were too advanced for the experience level of

---

<sup>40</sup> Watry, *Washout!: The Aviation Cadet Story*, 144.

the pilot, such as the B-26 Marauder medium bomber, or they pushed the state of aircraft technology, as was the case with the B-29 Superfortress heavy bomber. The B-26 gained a reputation as a dangerous airplane to be avoided and was nicknamed “The Widowmaker” by the crews. Only after an intensive public relations campaign, with support from the crews flying it in combat, was the reputation of the B-26 redeemed. In the case of the B-29, the Army Air Forces had invested too much time and money into the design to write it off. In order to demonstrate that the B-29 was a safe plane the Air Staff selected two Women AirForce Service Pilots to tour B-29 bases in order to demonstrate to the male pilots that the plane was safe enough for a woman to fly.<sup>41</sup>

The Office of Flying Safety attributed over half of all accidents in the continental United States to pilot error.<sup>42</sup> This was a wide-ranging category covering everything from lack of familiarity with an aircraft to a pilot with more confidence than ability. The former usually occurred during transition between phases of training and the latter during the later phases of training when a pilot believed there was nothing he could not do. Attributing the majority of accidents to pilot error also fit the narrative of the interwar pilots.

Some of the other causes for flight accidents included instructor error, mechanical error, and supervisory error. With the rapid expansion of the Army Air Forces there were bound to be some instructors who were not quite up to the task and during the first half of 1944 over 1,100 accidents in the official accident reports were attributed to instructor error.<sup>43</sup> Mechanical error

---

<sup>41</sup> General Paul Tibbets interview by Dawn Letson, Women AirForce Service Pilots Oral History Report, 24 February 1997 (The Woman’s Collection, Texas Women’s University, Denton TX, 2002). In this instance, AirForce is officially written as one word. In some sources the “F” is lowercase. However, Adela Riek Scharr, a former WASP, used the capital in her two-volume history on women pilots in World War Two, *Sisters in the Sky*.

<sup>42</sup> United States Army Air Forces, Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 36.

<sup>43</sup> United States Army Air Forces, *Accident Facts: U.S Army Air Forces*, 3.

could be the result of a defective component or could be the result of a mistake by the ground crew responsible for the maintenance of the aircraft. The last category was primarily the responsibility of the officers who supervised the operation and maintenance of the airfields. These accidents could be the result of anything from airfields being poorly lit to the clearance of aircraft for flight status that clearly should have been grounded but were cleared in order to maintain the pace of training.

The Army Air Forces took many steps to address the increasing number of accidents. The first was to establish the Office of Flying Safety in 1942. This office was the umbrella headquarters for safety procedures, education, and training. Although the Office was initially undermanned and underfunded, its staff almost immediately began issuing guidance for the investigation of accidents. The primary purpose of these investigations was to determine the cause of the accident. However, the Office of Flying Safety began collating the data in order to begin prescribing steps to prevent or mitigate future accidents. The next logical step was to educate the Army Air Forces about safety.

To spread the word about safety the office began producing posters to hang up around barracks and hangars. The Office of Flying Safety also published handbooks and pamphlets on safety to be issued to every pilot and crew. One of the most successful and popular methods was the adoption of animated short films to emphasize various aspects of safety. In addition, the Office of Flying Safety periodically issued press releases to reassure the public about the state of safety in the Army Air Force. One press release, issued in 1943, referred to a “force of field officers” sent out to assist squadron and group commanders as “missionaries of flying safety.”<sup>44</sup> As the war progressed, the word “safety” became more prevalent throughout the training

---

<sup>44</sup> Office of Flying Safety Press Release, 1943, 6.

literature. For example, a 1943 2<sup>nd</sup> Air Force flight-training directive stated that repetition in training was being eliminated between the phases of flight training except for “information or safety.”<sup>45</sup> The result of the Army Air Forces’ wartime experience was a standardization and awareness of safety that was not present before the war.

After 1947, this emphasis on safety became part of the Air Force’s campaign to enhance its image as a professional force. In a postwar study, *Safety as a Factor in the Future of Aviation*, the authors emphasized the Army Air Forces’ wartime experience with accidents as the driving force behind stricter standards in safety. In addition, the study noted that flight safety had also become an issue of national security as a means of reassuring the public about the professionalism of the newly independent Air Force. On the other hand, combat flying was still a dangerous business and, in that respect, the Air Force needed pilots whose attitude was not that much different from that of the prewar pilots. What had changed was the overall culture of the Air Force as it transitioned from the prewar “club like” organization, as Curtis LeMay described it, to a professional force with a major role in national defense.

---

<sup>45</sup> 2<sup>nd</sup> Air Force Flight Training Directive, 20 Aug 43, 3.

## Chapter 2 - Culture of Risk

During the airmail crisis, one Air Service area commander admonished a group commander via telegram, “THERE WILL BE NO MORE ACCIDENTS” to which the group commander replied, “THERE WILL BE NO MORE FLYING.”<sup>46</sup>

1934 telegram exchange. *The Men and Events that Shaped the Development of U.S. Air Power*.

The beginning of the age of flight coincided with a time when concern over workplace safety was on the rise in the United States. In the first three decades of the twentieth century, progressive organizations such as the American Association for Labor Legislation and the National Consumers League, made great strides in cleaning up workplace conditions and enacting policies to ensure worker safety.<sup>47</sup> For example, in 1922, the Safety Institute of America inaugurated a “Safety Week” in New York with the slogan “Don’t Get Hurt.”<sup>48</sup> The press release boasted that the week-long rally was going to use wartime methods, such as “four-minute men,” to instruct the public on safety.<sup>49</sup> As reported in the *New York Times*, “[t]he immediate goal of Safety Week is to save the lives of the seventy persons who would be killed by accident during

---

<sup>46</sup> DeWitt S. Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power* (McLean VA: EPM Publications, 1989; 1980), 196.

<sup>47</sup> Daniel T. Rodgers, *Atlantic Crossings: Social Politics in a Progressive Age* (Cambridge MA: Belknap Press of Harvard University Press, 1998), 237.

<sup>48</sup> *New York Times*, 8 October 1922.

<sup>49</sup> *Ibid.* “Four-minute men” was the name given to a group of volunteers who gave four-minute speeches during reel changes in theaters on topics, generally concerning the American war effort, approved by the Committee on Public Information .



this week in the ordinary course of events.”<sup>50</sup> Six years later, the Building Trades Employers’ Association ran a “Safety Poster Contest.”<sup>51</sup> The entrants were offered cash prizes for identifying the safety violations in the poster and submitting “. . . in his own words . . . how the jobs they recently worked on could have been made safer.”<sup>52</sup> This emphasis on safety reached down into the schools. In 1926, 100,000 parents attended safety rallies across New York. The meetings were intended “to curb the killing and injuring of children in the streets.”<sup>53</sup> The children prepared posters to support the goals of the rallies and the speakers encouraged the parents and teachers to develop “safety creed[s]” for the children and to pledge their commitment to safety.<sup>54</sup>

At the same time, it was also an era of great change, particularly after World War One. Despite President Harding’s exhortations about a “return to normalcy,” there was vibrancy and a yearning for greater achievements. Two examples were the skyscrapers reaching ever higher defining the skylines of the major cities, and a growing “airmindedness” among the postwar generation.<sup>55</sup> Much of this “airmindedness” was the result of the glamor associated with the aerial combat of World War One but also of the exploits of aviation pioneers such as Charles Lindbergh. However, less than six months after Lindbergh’s solo crossing of the Atlantic flight, the issue of trans-Atlantic flights became a topic for discussion at the annual convention of the Eastern District Evangelical Lutheran Synod of Ohio, and, as reported in the *New York Times*,

---

<sup>50</sup> Ibid.

<sup>51</sup> *New York Times*, 14 October 1928.

<sup>52</sup> Ibid.

<sup>53</sup> *New York Times*, 10 December 1926.

<sup>54</sup> Ibid.

<sup>55</sup> Ann Douglas, *Terrible Honesty: Mongrel Manhattan in the 1920s*, 1st ed. (New York: Farrar, Straus, and Giroux, 1995), 434.

“The latest transatlantic flights and risks are against the theological principle of endangering one’s life unnecessarily,” declared the Rev. W. E. Schaam of Butler, Pa.

The Rev. C. G. Wolf said that he questioned “the advisability of encouraging such risks as admirable feats of daring, such as our newspapers and editorial writers have done of late.”<sup>56</sup>

On the other hand, the next month the *New York Times* ran an article on a report by the Association of Life Insurance Medical Directors of America.<sup>57</sup> In the report the Association declared

...that the accident companies, in line with the reduction of restrictions during the last two years, have changed their policy contracts to cover any loss caused by any hazard of aviation while the insured is riding as a passenger “in a licensed airplane operated by a licensed pilot over a regular passenger route between definitely established airports.” Travel by air as a passenger under these conditions is “reasonably safe,” the report said.<sup>58</sup>

In addition, the article noted that one insurance company would also cover military pilots, for an additional premium.<sup>59</sup> However, the article pointed out, without explanation, that this same company would not cover passengers.<sup>60</sup> Regardless, the Lutheran ministers’ concerns aside, the insurance industry as a whole deemed flying to be a relative good risk for coverage.

---

<sup>56</sup> *New York Times*, 14 October 1928.

<sup>57</sup> *New York Times*, 28 October 1927.

<sup>58</sup> *Ibid.*

<sup>59</sup> *Ibid.*

<sup>60</sup> *Ibid.*

Another example of an expression of reaching skyward, began on the ground with the building of skyscrapers.<sup>61</sup> As the century progressed, builders of these skyscrapers vied with each other to build not only the tallest buildings; they also strove to put them up “with accuracy of measurement and precision of time.”<sup>62</sup> The Empire State Building was completed ahead of schedule in little more than a year and with only five fatalities. Both accomplishments were the direct result of the skill of the workmen. The workers were not daredevils *per se*, but they did suggest a certain disregard for the risk involved as they casually walked along the narrow girders hundreds of feet in the air. Years later, a study on the psychodynamics of organizations discovered that many of the workers exhibited a calm demeanor as they went about their business because that was expected by the “group.”<sup>63</sup> More importantly, if workers had any concerns about the risks inherent in the job, they were left with the impression that it was best if they kept “their worries to themselves.”<sup>64</sup>

It is an attitude best expressed by the American philosopher William James when he stated, “Refuse to express a passion, and it dies.”<sup>65</sup> His corollary is, “if we wish to conquer undesirable emotional tendencies in ourselves, we must assiduously, and in the first instance

---

<sup>61</sup> It should be noted that these skyscrapers, although being marvels of engineering, would not have been practical without the invention of the “safety elevator” by Elisha Otis in 1853.

<sup>62</sup> Ann Douglas, *Terrible Honesty: Mongrel Manhattan in the 1920s*, 1st ed. (New York: Farrar, Straus, and Giroux, 1995), 437.

<sup>63</sup> Larry Hirschhorn and Carole K. Barnett, *The Psychodynamics of Organizations* (Philadelphia PA: Temple University Press, 1993), 152.

<sup>64</sup> *Ibid.*, 152.

<sup>65</sup> William James and Robert D. Richardson, *The Heart of William James* (Cambridge MA: Belknap Press of Harvard University Press, 2010), 11.

cold-bloodedly, go through the outward motions of those contrary dispositions we prefer to cultivate.”<sup>66</sup> In James’ opinion,

If we fancy some strong emotion, and then try to abstract from our consciousness of it all feelings of its characteristic bodily symptoms, we find we have nothing left behind, no “mind-stuff” out of which the emotion can be constituted, and that a cold and neutral state of intellectual perception is all that remains.<sup>67</sup>

These traits and attitudes began to define the culture of the Air Service and were cultivated during the Air Corps period and in the Army Air Forces throughout World War Two.

Throughout the first three decades of the 20<sup>th</sup> Century, new aerial records were being set and broken on a regular basis. It was a new frontier that required risk takers to test the limits of what was possible with new machines and concepts. Moreover, with each accomplishment, the pilots became heroes to the public, the adulation encouraging them to greater feats of daring. It was in this environment that the early pilots of the Army earned their wings and were not only pushing the limits of flight but also looking to define the parameters of “airpower.” The culture of the early Air Service evolved into one where taking risks was not only acceptable but expected in order to meet the challenges of flying. Moreover, they grew up in a society that cheered their risk taking. This chapter will analyze the experiences of these early pilots in defining the culture of both the early Army Air Service and the Army Air Corps.

The Air Service’s experience with risk and accidents began when Lieutenant Thomas Selfridge strapped into the seat next to Orville Wright on 17 September 1908 for a demonstration flight. The ensuing flight ended when Orville crashed the plane, severely injuring himself and

---

<sup>66</sup> Ibid., 11.

<sup>67</sup> Ibid., 7.

killing Lieutenant Selfridge. Undeterred, the Army was still interested in pursuing aviation. However, the risk involved in this unproven technology was readily apparent. As airpower historian Dewitt Copp notes, the Army's first pilots laid their lives on the line every time "they sat down in a wicker chair between flimsy, cloth-covered wings and grasped the control levers."<sup>68</sup> Two years after the accident in which Lieutenant Selfridge died, Lieutenant Benjamin Foulois was sent to Fort Sam Houston with the Army's only airplane under orders to teach himself to fly.<sup>69</sup> Foulois accomplished this task mostly by corresponding with the Wright brothers.<sup>70</sup> After each mishap, Foulois would write to Orville and Wilbur for advice, and he would then wait for their reply before going back up to put their advice into practice.<sup>71</sup> While waiting for a reply from the Wrights may have been prudent, it still took a certain amount of courage for Foulois to go back and put their written advice into practice. Foulois survived the experience and became not only the first pilot licensed by the U. S. Army but also the only person thought to have learned to fly by correspondence.<sup>72</sup> Foulois continued to correspond with the Wrights after he left Fort Sam Houston. For example, in 1912, while at Fort Leavenworth training with Arnold, Foulois forwarded a list of specific technical questions concerning the Wright C airplane.<sup>73</sup> However, as the effort to establish a military air service proceeded, many others in the Army were not as fortunate. Arnold recalled that by the start of World War One, ten of 30 rated pilots had died in accidents; twelve quit flying, of their own accord, within a few

---

<sup>68</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 6.

<sup>69</sup> John F. Shiner, "Benjamin D. Foulois: In the Beginning" in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington DC: Office of Air Force History, 1987), 14.

<sup>70</sup> *Ibid.*, 14.

<sup>71</sup> *Ibid.*, 14.

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

<sup>73</sup> Letter from Lieutenant Benjamin Foulois to Orville Wright, 16 November 1912 (The Orville and Wilbur Wright Papers, The Library of Congress, Washington DC).

months of earning their wings; two quit after they “flew themselves out” and four died of natural causes.<sup>74</sup>

Many of the early pilots developed an almost fatalistic outlook about flying and accepted that accidents were inevitable given the fledgling if not primitive nature of aviation technology. In a post-World War Two study, the Air Force noted that “The design of military aircraft has been predicated on many factors other than safety.”<sup>75</sup> In the same postwar study an aircraft manufacturer pointed out, “It is not possible to make the plane foolproof, but only fool-resistant,” the implication being that pilots do foolish things that cannot be prevented.<sup>76</sup> However, that is an unfair assessment of pilots who often had to find out what worked through trial and error. Arnold described how he saw the situation in the early days of aviation: “As is usually the case in advances that are taking place daily in aeronautics, there were no precedents to follow.”<sup>77</sup> As will be discussed later, often in the early days of aviation, testing the limits of flight was a less a matter of being foolish and more about doing what was necessary.

Arnold also concluded that the problem of flying accidents appeared bigger because the scarcity of airplanes made every crash a front-page story.<sup>78</sup> At the same time, the pilots did not believe flying accidents were anything unusual. Ira Eaker noted in his biography that the occasional “crack up” was to be expected.<sup>79</sup> In fact, it was not until 1924 that the Air Service

---

<sup>74</sup> Henry Harley Arnold and John W. Huston, *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries* (Maxwell AFB AL: Air University Press, 2002), 110 n.

<sup>75</sup> United States Army Air Forces. Office of Flying Safety, *Safety as a Factor in the Future of Aviation* (Washington DC: Chamber of Commerce of the United States of America, 1946), 30.

<sup>76</sup> *Ibid.*, 35.

<sup>77</sup> Quoted in Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 30.

<sup>78</sup> Henry Harley Arnold, *Global Mission* (London: Hutchinson KS, 1951), 108.

<sup>79</sup> James Parton and Air Force Historical Foundation, *"Air Force Spoken Here": General Ira Eaker and the Command of the Air*, 1st ed. (Bethesda MD: Adler & Adler, 1986), 31.

required the appointment of an “accident investigating officer” at all airfields.<sup>80</sup> Even then, it was a very informal appointment that could be handled by the senior officer on the flight or by the “first Air Service officer to visit the scene....”<sup>81</sup> All of this created a kind of “cultural dissonance.” While one segment of society, the uninformed civilians, might read the reports of aircraft accidents and view them as disastrous, the pilots, with firsthand experience, viewed them as a common occurrence, albeit a common enough occurrence to be the deciding factor for many to give up flying. In 1913 alone, five of the fourteen rated pilots quit.<sup>82</sup> On the other hand, there were enough volunteers to make up the difference so that there were eighteen rated pilots by 1914.<sup>83</sup> In addition, advances in aviation technology, such as faster engines, were occurring at such a rapid rate that safety regulations and practices could not keep up. It also created an atmosphere best summed up by Billy Mitchell’s comment to Hap Arnold as he walked away from a “crack up”: “It’s all in a day’s work.”<sup>84</sup>

Contributing to this atmosphere was a general attitude that flying was mostly a hands-on, “learn by doing” affair, Benjamin Foulois’ experience with correspondence flight training being an extreme example.<sup>85</sup> Most received some number of hours of flight training, but there was neither an established curriculum nor a fixed amount of flight time. In Spring 1911, Arnold

---

<sup>80</sup> *New York Times*, 28 December 1924.

<sup>81</sup> *Ibid.*

<sup>82</sup> Alfred F. Hurley and William C. Heimdahl, “The Roots of U.S. Military Aviation,” ed. Bernard C. Nalty, *Winged Shield, Winged Sword: A History of the United States Air Force* (Washington DC: Air Force History and Museums Program, 1997), 26.

<sup>83</sup> *Ibid.*, 26.

<sup>84</sup> Arnold, *Global Mission*, 117.

<sup>85</sup> It should be noted that “learn by doing” was, in many cases, the accepted, if not the only, method for learning how to operate machinery. One example was driving an automobile. Obviously, the consequences for an error in learning to fly could be greater than learning to drive.

became one of the Army's two qualified aviators when he soloed after two-and-a-half hours of flight training and received his wings after an additional one hour and eighteen minutes of flight time.<sup>86</sup> This total represented 28 individual flights each averaging eight minutes.<sup>87</sup> Future Air Force Chief of Staff Carl Spaatz soloed after 55 minutes, an hour fewer than was typical for the time, though there was not a minimum number of required flight hours.<sup>88</sup> Spaatz acknowledged that ground school instruction was limited, consisting mainly of assembly and disassembly of the engine and very little on the theory of flight.<sup>89</sup> Ira Eaker soloed after four hours of dual instruction and eventually went on to command Eighth Air Force during World War Two.<sup>90</sup> This experience left the early pilots with an extreme amount of confidence in their ability to handle any situation that might arise during a flight. Arnold concluded that this created an atmosphere of "seat of the pants flying" and made the pilots "hostile to technical innovation" fearing that the instruments would make them "mechanical" pilots.<sup>91</sup> After the war, Arnold stated, the "seat of the pants' flying tradition [continued] much longer than it should have."<sup>92</sup> It should be noted that the only instrument on the airplane Arnold learned to fly was a piece of string to let the pilot know if he was in a skid, or an uncoordinated turn.<sup>93</sup>

---

<sup>86</sup> Arnold and Huston, *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries*, 4.

<sup>87</sup> *Ibid.*, 4.

<sup>88</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 27.

<sup>89</sup> *Ibid.*, 27.

<sup>90</sup> Parton and Air Force Historical Foundation, *"Air Force Spoken Here": General Ira Eaker and the Command of the Air*, 30.

<sup>91</sup> Arnold, *Global Mission*, 20-21.

<sup>92</sup> *Ibid.*, 20.

<sup>93</sup> *Ibid.*, 20.



As one among only a handful of pilots, Arnold had other duties related to establishing aviation in the US Army. Among these was overseeing the assembly of new aircraft and working with mechanics to insure that they understood how to maintain the aircraft.<sup>94</sup> He was also a flight instructor passing on his skill and knowledge to the other aspiring pilots. However, as an aviation pioneer in his own right Arnold understood the stress inherent in attempting to set new records. For example, Arnold set several altitude records, and he was the first pilot to take a member of Congress up in an airplane.<sup>95</sup> These experiences would stand Arnold in good stead when it came time to oversee the expansion of the Air Corps.

Nonetheless, despite being an accomplished and respected pilot, Arnold had doubts about “the flying game,” as he called it in the title of a book he co-wrote with Ira Eaker in 1936. In a letter to his wife dated 20 June 1913, Arnold, in spite of his declarations about “pilot error” being the primary cause of flying accidents, began to question flight in general. He wondered if “an unseen hand reaches out and turns the machines over in the air for there have been so many accidents that have never been explained.”<sup>96</sup> These doubts began in 1912 when two events shook up Arnold so much that he gave up flying. The first was the death of one of his instructors; the other was a near fatal crash of his own in November 1912.<sup>97</sup> Arnold was so shaken that he requested to be taken off flight status and a fellow officer noted, “Lieut[enant] Arnold has become so nervous as a result that he has not flown since, and perhaps will never

---

<sup>94</sup> Ibid., 17.

<sup>95</sup> Arnold and Huston, *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries*, 4-5.

<sup>96</sup> Ibid., 6.

<sup>97</sup> Arnold, *Global Mission*, 41.

again.”<sup>98</sup> Arnold was eventually enticed back to flying but his experience is indicative of the experiences of the early pilots.

Nonetheless, much of this hands on, learn-as-you-go training and “seat of the pants” flying was the result of these early pilots being more like test pilots as they grappled with not only the practical aspects of flying but also the theoretical side of adapting this new technology to warfare. For example, in 1913 Orville Wright attributed 90 percent of all airplanes accidents to the plane losing speed and stalling.<sup>99</sup> In a letter to the Army’s chief of aeronautics he wrote, “Many of these dives [caused by the stall] would not result seriously if the aviator had but the courage to cause the machine to make an even more fearful dive till it recovers its normal speed....”<sup>100</sup> In another example, Hoyt Vandenberg, as a young pilot with the 90<sup>th</sup> Attack Squadron, witnessed four of his fellow pilots die testing out new maneuvers proposed by Billy Mitchell.<sup>101</sup> As Philip Meilinger summarized in his biography of Vandenberg, “Air power at that time [the late 1920s] was ‘sensed’ rather than demonstrated.”<sup>102</sup> In other words, this early testing and experimentation was necessary in order to develop, not only the correct use of airpower, but also how best to safely fly airplanes.

---

<sup>98</sup> LT Joseph O. Marborgne to Chief Signal Officer, 10 November 1912, Benjamin D. Foulois Papers, Manuscript Division, Library of Congress, Washington DC in Arnold and Huston, *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries*, 6.

<sup>99</sup> DeWitt S. Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power* (McLean VA: EPM Publications, 1989; 1980), 9.

<sup>100</sup> Quoted in, *Ibid.*, 9.

<sup>101</sup> Phillip S. Meilinger, *Hoyt S. Vandenberg: The Life of a General* (Bloomington: Indiana University Press, 1989), 19.

<sup>102</sup> *Ibid.*, 19.

One early pilot, Byron Quimby Jones, attempted to figure out how to recover from a tailspin; up until Jones' flight, no one ever had successfully recovered from a spin.<sup>103</sup> Based on his understanding of aerodynamics, Jones studied the problem and came up with what he hoped would be the solution.<sup>104</sup> There was one way to find out. Jones, without a parachute because there were none, took his plane up to its maximum altitude and deliberately put it into a spin. Applying his solution Jones recovered from the spin. He did it several more times before he assured himself that he had found the answer.<sup>105</sup>

Many safety features such as seat belts and goggles were discovered by accident — both literally and figuratively. One of Arnold's contributions to flight safety came after he was hit in the eye by a bug and he suggested that goggles would be helpful.<sup>106</sup> Before that, a pilot simply prepared for flight by turning his hat around.<sup>107</sup> Neither rank nor assignment hampered this attitude of experimentation. During his tour as Chief of the Air Service, Major General James Fechet wanted to try out a parachute. His plan was to lie on the wing of a plane and after it was at a sufficient altitude, slide off, and pull the ripcord.<sup>108</sup> The example of the Chief of Staff lying on the wing of a plane in order to test a parachute was bound to set the tone for the culture within the organization.

The next challenge for the Air Service and the pilots came in combat over France. When the United States declared war in April 1917, the Air Service consisted of fifty-two officers and

---

<sup>103</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 169.

<sup>104</sup> *Ibid.*, 169.

<sup>105</sup> *Ibid.*, 169.

<sup>106</sup> Arnold, *Global Mission*, 21.

<sup>107</sup> *Ibid.*, 21.

<sup>108</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 75.

eleven hundred enlisted men.<sup>109</sup> Of the 130 rated pilots, Arnold believed “only 26 were really qualified.”<sup>110</sup> In addition, the Air Service had only 55 aircraft.<sup>111</sup> None of them were combat types, and, according to Arnold, 51 were obsolete.<sup>112</sup> The Air Service would be forced to rely upon the allies for aircraft; however, the need for aircrew was even greater. As one member of the AEF (American Expeditionary Forces) Training Section advised the Division of Military Aeronautics Observation Section:

We desired 200 artillery observers with aerial gunnery, but stated that the full number called for was desired even if all had not such training. You will have to make every effort to send us fully trained men at the earliest possible date, as the facilities in the AEF will not permit of giving anything more than a refresher course. . . . If fully trained material is not available, make up the requested number by the best partially trained men available.<sup>113</sup>

Among the “best partially trained men available” was future general and 5<sup>th</sup> Air Force commander George C. Kenney. In 1917, Lieutenant Kenney was sent to France with fewer than twenty hours of flight training.<sup>114</sup> To make up for the deficiency in stateside training the AEF established a large training facility at Issoudun, France in order to give the new pilots the benefit of French instructors with combat experience. Despite these shortcomings in training, the Air

---

<sup>109</sup> Arnold, *Global Mission*. 50.

<sup>110</sup> *Ibid.*, 50.

<sup>111</sup> *Ibid.*, 50.

<sup>112</sup> *Ibid.*, 50.

<sup>113</sup> Memo, D. R. Mayes to Captain W. W. Hoffman, Aug 17, 1918.

<sup>114</sup> Herman S. Wolk, “George C. Kenney: The Great Innovator,” in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington DC: Office of Air Force History, 1987) 128.

Service produced many good pilots. For instance, Kenney went on to shoot down two German planes and earned the Distinguished Service Cross and Silver Star.<sup>115</sup>

Stateside training was not only short but also dangerous. On top of the attrition through eliminations, training fatalities added to the number. In fact, training was more dangerous than combat. In 1918, the Secretary of War reported that for every aviator lost in combat two aviators lost their lives in training.<sup>116</sup> In total, aviators were 49 times more likely to die in accidents than the average of the Army as a whole.<sup>117</sup> In the Final Report of the United States Air Service, published in 1921, the Air Service reported that in the AEF 218 pilots and observers were killed in training, which amounted to an average of one fatality for every eighteen graduates.<sup>118</sup>

Those who survived the rigors of combat and training were a very confident group of flyers. Referring to a group of pilots after World War One, Arnold recalled: “They were typical of the entire group of war pilots, cocky even in their disregard of instruments and maps. Why worry? They could fly anywhere, anytime.”<sup>119</sup> On one occasion, a mechanic told Ira Eaker that the engine on the plane he was about to fly did not sound right and that he should not fly it. Eaker ignored the mechanic and, after twenty minutes in the air, Eaker was forced to ditch his

---

<sup>115</sup> Ibid. 128.

<sup>116</sup> Weekly News Letter (Division Military Aeronautics), week ending Sat, December 7, 1918 in Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Air Force History and Museums Programs, 1999), 221.

<sup>117</sup> Memorandum from Colonel A.L. Fuller to Executive Officer, Mar 9, 1920 in Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Air Force History and Museums Programs, 1999), 221.

<sup>118</sup> Maurer Maurer, *The U.S. Air Service in World War I* (Maxwell AFB AL; Washington DC: Albert F. Simpson Historical Research Center; 1978; 1979), 110.

<sup>119</sup> Arnold, *Global Mission*, 89.

plane in San Diego Bay. The lesson Eaker took from the incident was to check his ego and always heed the advice of a mechanic.<sup>120</sup> In a display of pure bravado, future Medal of Honor recipient James Doolittle, on nothing more than a bet, sat between the wheels of an airplane as it landed.<sup>121</sup> The base commander, Hap Arnold, grounded him for one month.<sup>122</sup> For a pilot like Doolittle this was far worse than any other punishment Arnold could have given him.

Another series of events also set the tone for the organizational culture of the early Air Force. During the early days of flight, aviation records and “firsts” were being set at a remarkable pace and many of these records were set and broken by Air Corps pilots. It was in this atmosphere that the men who would lead the United States Army Air Forces (USAAF) during World War Two came of age. It also set them apart from those who would come later and added to the camaraderie and a “club-like” feeling in the interwar Air Corps. However, in some cases their attitude and zealotry in pressing the cause of airpower led to friction between themselves and their more ground-minded peers. Later in life, looking back on this period, Ira Eaker would bemoan the loss of that atmosphere. He noted that the overriding skill that the early flyers had used to define themselves was flying, and according to Eaker they had had unlimited opportunities: “We had something that is impossible now: we could take planes and go on cross country flights of our own volition, between cities and stations.”<sup>123</sup> Another early flyer, James Doolittle took advantage of these unlimited opportunities to sharpen his cross-country flying skills. At one station, he had memorized the countryside so well that, even in bad weather, he

---

<sup>120</sup> Parton and Air Force Historical Foundation, *"Air Force Spoken Here": General Ira Eaker and the Command of the Air*, 31.

<sup>121</sup> Arnold, *Global Mission*, 91.

<sup>122</sup> *Ibid.*, 91.

<sup>123</sup> Parton and Air Force Historical Foundation, *"Air Force Spoken Here": General Ira Eaker and the Command of the Air*, 62.

could orient himself merely by glimpsing a familiar barn or terrain feature.<sup>124</sup> However, this daring and initiative were not always appreciated. Doolittle admitted that he had at times been irresponsible – “quite a few actually,” he once told his wife.<sup>125</sup> However, he never doubted his ability and was very upset when he was told by his base commander that he did not “have enough sense to be a good airplane pilot” for flying in weather that would keep “rational men on the ground.”<sup>126</sup>

Some of the records set by the Air Corps aviators were individual firsts such as Arnold’s early altitude records or Eaker’s instrument-only transcontinental flight in 1936.<sup>127</sup> Others were collective efforts such as the first aerial circumnavigation of the world in 1924. Another example was a duration flight given the name “Question Mark” to test the feasibility of air-to-air refueling and to set a new endurance record. The idea came up during a card game among Eaker, Elwood “Pete” Quesada, and Fechet. Quesada broached the idea and Fechet, the Chief of the Air Corps, replied, “Not a bad thought.”<sup>128</sup> As simply as that, the planning for the flight began. Nonetheless, all of these attempts, successful or not, went far to establishing a “can do” spirit that any obstacle could be overcome by the perseverance and ingenuity of the pilot. These experiences also contributed to a building esprit among the pilots that drew them closer together within their “club.” For example, during the refueling and endurance test flight of the *Question Mark* — a tri-motor Atlantic-Fokker C-2A fitted out for the experiment in the project of the same name —

---

<sup>124</sup> Joanna Doolittle Hoppes, *Calculated Risk: The Extraordinary Life of Jimmy Doolittle, Aviation Pioneer and World War II Hero* (Santa Monica CA: Santa Monica Press, 2004), 78.

<sup>125</sup> *Ibid.*, 79.

<sup>126</sup> *Ibid.*, 79.

<sup>127</sup> James Parton and Air Force Historical Foundation, *“Air Force Spoken Here”: General Ira Eaker and the Command of the Air*, 1st ed. (Bethesda MD: Adler & Adler, 1986), 99.

<sup>128</sup> Parton and Air Force Historical Foundation, *“Air Force Spoken Here”: General Ira Eaker and the Command of the Air*, 70.

Spaatz was drenched with aviation gas. He immediately stripped off his clothes and the rest of the crew rubbed him down with oil-soaked rags to prevent the fuel from burning his skin. He spent the rest of the refueling wearing only a parachute and a light coat of oil.<sup>129</sup> Spaatz refused to abort the mission and eventually clothes were transferred to his plane. At one point during a long-distance flight, the landing gear on a plane was stuck in the raised position. The plan to lower it was for one of the crew to go out on the wing to stand on the stuck gear, using his weight to force it down. The crew, all having experience with “wing-walking” during training flights, not as a matter of policy but as a personal challenge, knew this would work.<sup>130</sup> Not every experiment or test ended in success and many ended tragically. Nonetheless, each death reinforced the fact that flying was an inherently risky business, even as the aircraft improved.

As the aircraft improved with each advancement there was developing among the pilots a mien Tom Wolfe would later call “the right stuff.”<sup>131</sup> Even if they did not discuss it, these pilots were exhibiting William James’ previously discussed philosophy on emotions and their physical manifestation. By demonstrating that they could control their emotions in any situation they were outwardly exhibiting that they could physically control the situation as well. This attitude manifested itself in an air of confidence the pilot projected concerning his own abilities. Therefore, if a pilot died in an accident it must have been the result of “pilot error”, something that would never happen if the pilot had “the right stuff.” In *Global Mission*, Arnold noted that after every crash, despite the state of early aviation technology, “almost always the pilot was

---

<sup>129</sup> Bernard C. Nalty *et al.*, *With Courage: The U.S. Army Air Forces in World War II* (Washington DC: Air Force History & Museums Program, 1994), 110.

<sup>130</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 70.

<sup>131</sup> Tom Wolfe, *The Right Stuff*, new ed. (New York: Farrar, Straus, Giroux, 1983), 436.



blamed for being in error.”<sup>132</sup> As will be discussed in later chapters, the majority of flying accidents during World War Two were attributed to pilot error. According to Arnold, he and his peers would discuss a fellow pilot’s crash and conclude that “He must have done something that you would never do.”<sup>133</sup> In other words, “[h]e,” the dead pilot, obviously was not as good a pilot as the survivors; otherwise, he would not have died.

At the same time, the early Air Corps pilots were setting the standards for personal bravery. In 1935, two pilots were awarded the Soldier’s Medal for their bravery while attempting to rescue the crew of a crashed plane.<sup>134</sup> Ironically, however, one of the pilots died in another crash before President Roosevelt could award him the medal.<sup>135</sup> On the other hand, bravery, in some instances, had a personal meaning more closely related to the image the pilots wanted to project. For example, some pilots considered something logical, from a safety point of view, such as the parachute, as an affront to their personal bravery. In fact, the issue over the use of parachutes developed into an impassioned debate in the early 1920s. Many pilots believed that parachutes should be banned, and one made his claim in a letter in the *Air Service News*. He claimed that his view was shared “by a majority if not all, the older pilots at his station.”<sup>136</sup> He went on to declare that wearing parachutes would “encourage faintheartedness.”<sup>137</sup>

Pilots also accepted that, even under the best conditions, theirs was a particularly hazardous profession and that death was a possibility any time they flew. As a result, each

---

<sup>132</sup> Arnold, *Global Mission*, 20.

<sup>133</sup> *Ibid.*, 20.

<sup>134</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 330.

<sup>135</sup> *Ibid.*, 330.

<sup>136</sup> Quoted in *ibid.*, 278.

<sup>137</sup> *Ibid.*, 279.

developed his own internal coping mechanisms. For example, Carl Spaatz observed after one of his classmates died in a training accident:

My mind must be case hardened, since my reactions in these cases are not severe, a few thoughts as to whether it is worthwhile and an attempt to follow the reason for being worried or afraid of lesser affairs when I am not worried or afraid of death and then back to the normal existence of eating, sleeping and occasionally some thinking.<sup>138</sup>

He went on: “A crash always does make one slightly apprehensive and a little more cautious for a more or less extended period.”<sup>139</sup> Spaatz concluded: “It may be ridiculous for an aviator to worry about old age....”<sup>140</sup> Arnold later stated that in 1912 he had quit flying because he was about to be married, and, in those days, “you didn’t plan to continue flying after you were married—unless you were an optimist.”<sup>141</sup>

However, there was a downside to this sense of bravado and courage. This attitude contributed to accumulating approximately 300 accidents per year.<sup>142</sup> These 300 accidents resulted in the deaths of one in twenty pilots or five percent of the force.<sup>143</sup> Despite requests for more funding, the Air Service, at its lowest point in 1924, possessed 1,364 aircraft of which only 754 were considered first-line.<sup>144</sup> Between 1926 and 1930, the Air Corps (the Army Air Service

---

<sup>138</sup> Ibid., 42.

<sup>139</sup> Ibid., 43.

<sup>140</sup> Ibid., 43.

<sup>141</sup> Arnold, *Global Mission*, 43.

<sup>142</sup> John F. Shiner, “From Air Service to Air Corps: The Era of Billy Mitchell,” ed. Bernard C. Nalty, *Winged Shield, Winged Sword: A History of the United States Air Force* (Washington DC: Air Force History and Museums Program, 1997). 83.

<sup>143</sup> Ibid., 83.

<sup>144</sup> Ibid., 84.

became the Army Air Corps in 1926) lost approximately 121 aircraft annually.<sup>145</sup> For 1930, this accounted for eight percent of the total aircraft the Air Corps possessed.<sup>146</sup> Moreover, the rate of fatalities averaged 27 per 100,000 hours of flight. This rate was three times higher than during the 1930s.<sup>147</sup> At one point, in 1934, Carl Spaatz as Chief of Training and Operations noted that the shortage of aircraft was hindering flight training, adding that the number of aircraft to be procured in 1935 would not make up for the losses in 1934.<sup>148</sup>

Attrition in training was not much better with nearly 40 percent of those accepted into training being washed out or dying in accidents.<sup>149</sup> In 1923, nearly half of Vandenberg's class was eliminated for academics or lack of flight proficiency and another six were killed in accidents.<sup>150</sup> This contributed to the fatalistic attitude developed by many of the pilots. For example, Brigadier General Noel Parrish summed the situation up best during a 1974 interview, recalling the postwar World War One years when he was a young pilot. He commented: "with the casualty rates we had . . . you [were] in combat against nature, ignorance and other factors practically all the time. The weather, gravitation, and so on were your enemy constantly."<sup>151</sup> It should be noted that the Air Corps kept meticulous records of all of its activities. For example, the Air Corps tracked rates of fuel consumption, hours flown, and ammunition expended. However, when it came to deaths and eliminations in training, the Air Corps merged the data into one data point. The merging of these two data points continued throughout World War Two. In

---

<sup>145</sup> Ibid., 107.

<sup>146</sup> Ibid., 107.

<sup>147</sup> Ibid., 83

<sup>148</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 257

<sup>149</sup> Nalty et al., *With Courage: The U.S. Army Air Forces in World War II*, 173.

<sup>150</sup> Meilinger, *Hoyt S. Vandenberg: The Life of a General*, 17.

<sup>151</sup> Noel F. Parrish, interview by James C. Hasdorff, (United States Air Force Oral History Program, 10-14 June 1974), 34.

addition, as aviation historian Rebecca Cameron noted in *Training to Fly*, the Air Force has never been forthcoming about fatalities.<sup>152</sup>

On the other hand, those in the Air Corps led a leisurely life in the interwar period. The pilots usually reported for duty at 0730. They began flying at 0800, and stopped at 1130 for lunch at the officers club until 1330. The duty day typically ended at 1530. Typically, their weekends were free along with a half day off on Wednesdays, and “almost no one worked at night.”<sup>153</sup> Curtis LeMay, future commander of the 20<sup>th</sup> Air Force in the Pacific during World War Two, claimed that the interwar Air Corps “...was more like a flying club than a military organization.”<sup>154</sup> LeMay added: “It was almost like a public relations outfit; that’s what it amounted to, throughout the air force.”<sup>155</sup> In fact, as airpower historian John Shiner noted in *Winged Shield, Winged Sword: A History of the United States Air Force*, “The combination of pioneer and publicist found in [Billy] Mitchell was common among Air Service officers.”<sup>156</sup>

While the official purpose of these public relations efforts was to promote the Air Corps and airpower, they also reinforced the notion among the pilots that they were part of a unique fraternity, a fraternity that was defined by flying skill and daring. Early in his career, Arnold recalled that pilots were allowed to “moonlight” as stunt flyers in movies in order to promote

---

<sup>152</sup> Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Air Force History and Museums Programs, 1999), 667.

<sup>153</sup> Nalty *et al.*, *With Courage: The U.S. Army Air Forces in World War II*, 123.

<sup>154</sup> Curtis E. LeMay *et al.*, *Strategic Air Warfare: An Interview with Generals Curtis E. LeMay, Leon W. Johnson, David A. Burchinal, and Jack J. Catton* (Washington DC: Office of Air Force History, U.S. Air Force, 1988), 21.

<sup>155</sup> *Ibid.*, 21.

<sup>156</sup> John F. Shiner, “From Air Service to Air Corps: The Era of Billy Mitchell,” ed. Bernard C. Nalty, *Winged Shield, Winged Sword: A History of the United States Air Force* (Washington DC: Air Force History and Museums Program, 1997). 91.

aviation.<sup>157</sup> In 1926, Hoyt Vandenberg was selected to be the stunt pilot for the lead character in the movie *Wings*.<sup>158</sup> For two weeks, Vandenberg would take off, then duck inside the fuselage during filming, and then pop back up to land the plane.<sup>159</sup> A more bizarre example of efforts to stimulate public interest in Army aviation occurred when Arnold challenged a group of homing pigeons to a race from Portland, Oregon to San Francisco. Despite some mechanical problems, Arnold won.<sup>160</sup> Arnold's efforts and his success at selling the Air Service were rewarded by his being appointed the first director of the Air Service Information Section. The section handled all publicity matters for the Air Service.<sup>161</sup> The job of the Far West Flying Circus, commanded by Spaatz, was to generate public interest in Army Aviation by putting on exhibitions of stunt flying and mock dogfights.<sup>162</sup>

Spaatz' experience was not unique and some commanders thought that these publicity stunts were often done to the detriment of training for war.<sup>163</sup> For example, Benjamin Foulois bemoaned the fact that his attempts to "whip his [group] into a combat-ready force" were occasionally derailed by publicity taskings.<sup>164</sup> One such time was when his group was tasked to provide a plane so Babe Ruth could catch a ball dropped from the plane.<sup>165</sup> The ball was dropped from 250 feet, and Foulois recalled that Ruth was "knocked flat" [to the ground] the first two

---

<sup>157</sup> Arnold and Huston, *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries*, 5.

<sup>158</sup> Meilinger, *Hoyt S. Vandenberg: The Life of a General*, 19.

<sup>159</sup> *Ibid.*, 19.

<sup>160</sup> Arnold, *Global Mission*, 100-101.

<sup>161</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 37.

<sup>162</sup> *Ibid.*, 28.

<sup>163</sup> John F. Shiner, "Benjamin D. Foulois: In the Beginning" in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington DC: Office of Air Force History, 1987), 21.

<sup>164</sup> *Ibid.*, 21.

<sup>165</sup> *Ibid.*, 21.

attempts.<sup>166</sup> Regardless, the exercise had no value beyond the publicity it provided both parties. Nonetheless, the greater goal for the Air Corps was to generate interest among the American public in aviation and Army aviation in particular. As the official history put it, “the public in general was receptive to Air Corps publicity.”<sup>167</sup>

In 1934, the Air Corps faced its biggest challenge when President Roosevelt asked the Air Corps to take over the airmail routes. During the 78 days when the Air Corps was responsible for airmail operations, its pilots flew badly equipped aircraft over unfamiliar routes during one of the worst winters on record. This incident demonstrated, in a very tragic way, how woefully lacking the Air Force was in equipment and training. In the same year when the Air Corps assumed responsibility for flying the airmail, commercial airline pilots were averaging 100 hours flight time a month and a considerable amount of night and instrument flying. At the same time, however, the Air Corps allocated only sixteen flight hours a month for squadron and group commanders and ten hours for all other tactical pilots.<sup>168</sup>

The experience of Frank Andrews as the commander of the 1<sup>st</sup> Pursuit Group is a good example of these shortcomings. When he took command of the group in 1933, Andrews realized that not many of his pilots had been trained to fly under instrument conditions.<sup>169</sup> He also noted that not one of his aircraft possessed even the rudimentary equipment found on commercial aircraft for instrument flying.<sup>170</sup> It was a vicious circle. The Air Corps did not possess the

---

<sup>166</sup> Ibid., 21.

<sup>167</sup> Wesley Frank Craven *et al.*, *The Army Air Forces in World War II, Vol. 6: Men and Planes* (Washington DC: Office of Air Force History, US GPO, 1983; 1948), 440.

<sup>168</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 531, 174.

<sup>169</sup> Dewitt S. Copp, “Frank M. Andrews: Marshall’s Airman,” in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington DC: Office of Air Force History, 1987), 47.

<sup>170</sup> Ibid., 47.

equipment to fly at night or in inclement weather. Therefore the Air Corps developed doctrine that did not feature that type of flying, As a result, it was accepted that pursuit pilots did not fly in formation or engage in combat when visibility was limited.<sup>171</sup> Moreover, the experience of the bomber pilots confirmed that it was difficult, at best, to locate or bomb targets under such conditions.<sup>172</sup> The primary reason the Air Corps did not have the equipment was that it was expensive. This was the state of training and equipment when President Roosevelt put the Army Air Corps at risk by calling upon it to assume responsibility for delivering airmail in February 1934.

That month, the President cancelled the airlines' contracts to carry mail in order to clear up some "contractual irregularities."<sup>173</sup> He then asked representatives for the Post Office Department to check with the Chief of the Air Corps, Major General Benjamin Foulois, on the feasibility of the Air Corps taking over the airmail routes. After a brief three-hour meeting with his staff, General Foulois assured the President that the Air Corps would be ready to fly the mail routes within ten days. Foulois was convinced that flying the mail would be no more perilous than "normal peacetime training."<sup>174</sup> He thought this despite the fact that, in the six months leading up to the airmail operation, the Air Corps had lost 23 pilots in flying accidents,<sup>175</sup> not to mention that flying the mail required skills his pilots lacked or were not very proficient in such as instrument and night flying.<sup>176</sup> Some of the group and squadron commanders, such as Major

---

<sup>171</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 125.

<sup>172</sup> *Ibid.*, 125.

<sup>173</sup> John L. Frisbee, "Valor: AACMO - Fiasco or Victory," *Airforce-Magazine* 78, no. 3 (1995).

<sup>174</sup> John F. Shiner, "Benjamin D. Foulois: In the Beginning" in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington DC: Office of Air Force History, 1987), 30.

<sup>175</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 186.

<sup>176</sup> Frisbee, *Valor: AACMO - Fiasco or Victory*.

Hugh Knerr in command of Field Services at Wright Field, voiced their concerns about the lack of equipment and the proficiency of their pilots. On the other hand, the pilots, according to Lieutenant Elwood “Pete” Quesada, showed little concern for the weather, since they were young and did not lack for confidence in their own abilities.<sup>177</sup> On 12 March 1934, Arnold voiced his opinion about the pilots in a letter to his wife:

We didn’t have enough experienced pilots to carry on and had to use inexperienced flyers who lacked the mature judgment, who were afraid to turn back, who did not know when they were getting into trouble, and had too high an opinion of their own capabilities.<sup>178</sup>

If the pilots were convinced that they could handle whatever challenge came their way, the planes, on the other hand, were another matter.

Foulois ordered that the latest navigation equipment, such as directional compasses and artificial horizons, be installed on all mail-carrying aircraft.<sup>179</sup> Unfortunately, the Air Corps did not have the resources to execute his order. At the beginning of 1934, the Air Corps had 274 directional compasses and 460 artificial horizons on hand in the various depots. They were being held for new aircraft the Air Corps planned on procuring.<sup>180</sup> What radios the Air Corps possessed were of limited range when compared with the 400-mile range of the then current commercial aircraft radios.<sup>181</sup> The problem was compounded by the mechanics who installed the equipment. They often placed the equipment where it was convenient for installation but not readily

---

<sup>177</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 183.

<sup>178</sup> Arnold and Huston, *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries*, 31.

<sup>179</sup> John F. Shiner, “Benjamin D. Foulois: In the Beginning” in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington DC: Office of Air Force History, 1987), 30.

<sup>180</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 167

<sup>181</sup> *Ibid.*, 167.



observable by the pilot.<sup>182</sup> For their part, the pilots were not always comfortable with the new equipment, because they had had little time to train with it, and also preferred to rely on the “seat of their pants” when they found themselves in bad situations.<sup>183</sup>

At times, the Air Corps staff’s solutions to the problem of these accidents only further exasperated the pilots and crews. For example, at one point, the staff ordered that one of the few planes that was properly instrumented for the airmail mission be grounded. The reason given was that the crew could not bail out of the plane quickly in an emergency. One of the pilots pointed out that it was the one plane the crews would not have to bail out of because it was properly equipped for instrument flying. Instead, he urged that the order should be reversed and that all the other planes should be grounded. The order was eventually rescinded, however, the other planes were not grounded either.<sup>184</sup>

Unfortunately, despite the Air Corps’ attempts to insure the safety of the pilots and planes, its overall safety record during the airmail disaster was abysmal. The majority of the pilots had fewer than two years of flight experience and even fewer had more than 50 hours of night flying, let alone flying in bad weather.<sup>185</sup> In the first three weeks of airmail operations, the Air Corps lost ten pilots, four on one day.<sup>186</sup> Throughout the operation there were 66 crashes resulting in twelve deaths. The public’s faith in the Air Corps was shaken by this tragedy and the public outcry was led by such aviation luminaries such as World War One ace Eddie

---

<sup>182</sup> John F. Shiner, “Benjamin D. Foulois: In the Beginning” in *Makers of the United States Air Force*, ed. John L. Frisbee (Washington DC: Office of Air Force History, 1987), 30.

<sup>183</sup> *Ibid.*, 30.

<sup>184</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 202-203.

<sup>185</sup> Frisbee, *Valor: AACMO - Fiasco or Victory*.

<sup>186</sup> James P. Tate, *The Army and its Air Corps: Army Policy Toward Aviation, 1919-1941* (Maxwell AFB AL; Washington DC: Air University Press; 1998), 131-132.

Rickenbacker. Rickenbacker referred to the order authorizing the Air Corps to carry the mail as “legalized murder.”<sup>187</sup> In order to curb the accident rate and manage the public uproar, Roosevelt ordered Foulois to reduce the number of routes and to ground his least experienced pilots.<sup>188</sup> By spring, the Air Corps was beginning to adjust to this mission and the accident rate was going down. However, by that time, the political impasse between President and the airlines has been resolved and new contracts were let to the commercial airlines. Much to the chagrin of Foulois and the Air Corps, it was relieved of the mail delivery mission in June 1934.

One result of the airmail of the fiasco was the establishment of the Baker Board. Appointed by Secretary of War George H. Dern, former Secretary of War Newton D. Baker was charged with investigating the airmail fiasco and the readiness of the Air Corps in general. At its first meeting, Dern gave the board its mandate: “Many of our citizens are bewildered. They do not know whether we have a good military air force or not. If we have, the public ought to know it and be reassured. If, on the other hand, we are deficient in equipment, personnel, or training we want your best judgment as to what should be done to bring us up to a satisfactory standard.”<sup>189</sup> Future Medal of Honor recipient Leon K. Johnson, while a student at the War College, best summed up the Air Corps’ frustration when he wrote: “Many people are prone to judge our possibilities in time of war by limitations which peacetime operations impose upon us....”<sup>190</sup> Johnson was voicing the frustration of many in the Air Corps over the meager budgets during the interwar years and the effect of those budgets on training and equipment.

---

<sup>187</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 187.

<sup>188</sup> *Ibid.*, 212-213.

<sup>189</sup> War Department news releases, 10 and 17 April 1934, quoted in James P. Tate, *The Army and its Air Corps: Army Policy Toward Aviation, 1919-1941* (Maxwell AFB AL: Air University Press; 1998), 144.

<sup>190</sup> James P. Tate, *The Army and its Air Corps: Army Policy Toward Aviation, 1919-1941* (Maxwell AFB AL: Air University Press; 1998), 128.

Among the board's recommendations was that the Air Force require at least ten hours of flight time per pilot per month.<sup>191</sup> The board also recommended that the War Department should establish a means for determining if the Army's pilots were qualified for flying duty. The War Department established the standard for pilot certification at 100 hours per year, which was to include 35 hours in navigation, ten hours at night and ten hours on instruments.<sup>192</sup> The Air Corps also began to place more emphasis on instrument and cross-country flying.<sup>193</sup>

Internally, the morale of the Air Corps was shaken by the airmail fiasco. The same Major Hugh Knerr who had voiced his concerns later wrote: "This arbitrary assignment to an impracticable task was inexcusable. We had neither the personnel nor the modern aircraft for an operation the Air Mail had taken years to develop. No one paid any heed to our warning of disaster."<sup>194</sup> In defending Foulois, Arnold noted that, given a general "willingness to accept any and all challenges," he believed that any Air Corps officer would have made the same decision as Foulois.<sup>195</sup> The pilots themselves were disappointed because they believed that they had been found wanting and had failed a critical test.<sup>196</sup> Regardless, the Air Corps took the lessons to heart and set about addressing them.

Multi-engine aircraft pilots received particular attention. Most pilots had a minimum of 750 flight hours before being assigned to a bombardment squadron.<sup>197</sup> If it was a B-17 or B-18

---

<sup>191</sup>Baker Board Report, quoted in James P. Tate, *The Army and its Air Corps: Army Policy Toward Aviation, 1919-1941* (Maxwell AFB AL: Air University Press; 1998), 145.

<sup>192</sup> Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington DC: Office of Air Force History, U.S. Air Force, 1987), 378.

<sup>193</sup> *Ibid.*, 378.

<sup>194</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 167.

<sup>195</sup> Arnold, *Global Mission*, 143.

<sup>196</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 212-213.

<sup>197</sup> Maurer, *Aviation in the U.S. Army, 1919-1939*, 379.

squadron, the pilot had to fly fifty hours as a co-pilot before being rated as a pilot; but, even then, he would not be assigned as an airplane commander until he had seven years' experience and 2,000 hours as a rated pilot.<sup>198</sup>

During the interwar period it was assumed that a good pilot was also a good bombardier and vice versa. In order to insure proficiency, there was much cross training between positions, including navigators and gunners. For example, the 19<sup>th</sup> Bomb Group commander set a very high standard for his crews. A crew was not fully trained until every officer was qualified as pilot or co-pilot, celestial navigator, expert bombardier, and expert gunner.<sup>199</sup> In addition, all enlisted crew members had to qualify in their specialties — engineer, armorer, or radio operator — but also to become expert as gunners.<sup>200</sup> The overall effect was to create well-balanced crews, but also to inculcate in the culture the idea that any task could be mastered by any and all. However, the standard in the 19<sup>th</sup> Bomb Group was the personal choice of the commander.

By the end of the 1930s, the Air Corps was a combat force without enough equipment or enough skilled technicians and with little emphasis on combat skills. LeMay observed: “True, we had a little bit of gunnery here and there, but day-to-day we had no emphasis on tactics or preparing to fight an air war.”<sup>201</sup> It should be noted, LeMay's concerns aside, the Air Corps was preparing the doctrine to fight an air war at the Air Corps Tactical School. The efficacy of that doctrine is outside the scope of this study. Nevertheless, over the course of the 1930s, the Air Corps was making progress in standardizing training and becoming more professional, but it would be hard to shed the “club-like” atmosphere that LeMay had noted. This was about to

---

<sup>198</sup> Headquarters, General Headquarters Air Force Memorandum 5, Personnel and Training, 6 March 1937.

<sup>199</sup> *Ibid.*, 381.

<sup>200</sup> *Ibid.*, 381.

<sup>201</sup> LeMay *et al.*, *Strategic Air Warfare: An Interview with Generals Curtis E. LeMay, Leon W. Johnson, David A. Burchinal, and Jack J. Catton*, 21.

change in 1939 when President Roosevelt directed the air staff to begin planning for an expansion of the Air Corps to 50,000 men, nearly doubling it in size.<sup>202</sup>

The Air Corps Act of 1926 had authorized 1,630 commissioned officers for the Air Corps, but for budgetary reasons the Air Corps had consistently kept the number at approximately 1,250.<sup>203</sup> This was just enough to accommodate applicants from the United States Military Academy who had priority over all others.<sup>204</sup> However, by the 1930s the number of aviation cadets entering flight training had been steadily increasing. Between 1937 and 1939, the number of aviation cadets increased from 340 to 872, from all sources.<sup>205</sup> Before the expansion program, training was conducted at a relatively slow pace. Three times a year, a new class would begin at each training center.<sup>206</sup> The training consisted of three sequential phases — primary, basic, and advanced.<sup>207</sup> The cadets moved through the phases based on performance before moving on to a tactical unit to complete their training.<sup>208</sup> As the official history of the Training Command concluded, the system, before the expansion program, produced a small number of highly qualified pilots and officers.<sup>209</sup> Beginning in July 1939, the Air Corps began classes every six weeks with 400 students, expecting half to wash out.<sup>210</sup>

Before 1939, procurement of qualified candidates had been the responsibility of each of the nine corps area and the success of the recruiting was usually the result of the emphasis the

---

<sup>202</sup> Maurer, *Aviation in the U.S. Army, 1919-1939*, 446.

<sup>203</sup> *Ibid.*, 450.

<sup>204</sup> *Ibid.*, 450.

<sup>205</sup> Annual Report of the Chief of Staff of the Air Force 1937, 1938, and 1939.

<sup>206</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 301.

<sup>207</sup> *Ibid.*, 301.

<sup>208</sup> *Ibid.*, 301.

<sup>209</sup> *Ibid.*, 301.

<sup>210</sup> *Ibid.*, 301.

corps area commander placed on the program.<sup>211</sup> Each corps area was assigned a quota of cadets based not only on the needs of the Air Corps but also on the “extent of the population.”<sup>212</sup> The Air Corps, as discussed previously, had always been conscious of the need to develop good public relations in order to convince the American people on the potential of airpower. With the expansion program, the Air Corps turned this effort to recruiting and, according to the official history on aircrew procurement; publicity was the cornerstone of this recruiting effort.<sup>213</sup> Local publicity was the responsibility of the corps area commanders and consisted of recruiting posters, literature, and the occasional radio announcement.<sup>214</sup> Another tool for the corps areas was publishing articles in local newspapers about the flight training of local boys.<sup>215</sup> National publicity was handled through the War Department Bureau of Public Relations in cooperation with the Air Corps and included radio spots, magazine articles, and films.<sup>216</sup> One of the most popular was the 1941 full-length movie “*I Wanted Wings*.” Based on the book of the same name by Lieutenant Beirne Lay, Jr., the movie follows three young men as they undergo flight training at Kelly Field. In 1942, Jimmy Stewart made a seventeen-minute short titled “*Winning Your Wings*.” In the film, Stewart describes what a prospective cadet could expect during training.<sup>217</sup>

---

<sup>211</sup> United States Army Air Forces, *Army Air Forces Historical Study no 15: Procurement of Aircrew Trainees* (Maxwell Field, AL: US Army Air Forces, [1944]), 22-24.

<sup>212</sup> *Ibid.*, 22-24.

<sup>213</sup> *Ibid.*, 22-24.

<sup>214</sup> *Ibid.*, 24.

<sup>215</sup> *Ibid.*, 24-26.

<sup>216</sup> Craven *et al.*, *The Army Air Forces in World War II, Vol. 6: Men and Planes*, 440.

<sup>217</sup> The US Navy used similar methods to entice young men into naval aviation. For example, in the hour-long feature *Flight Sense*, Robert Taylor starred as the training squadron commander taking cadets through US Navy primary flight training.

The public relations efforts would pay off during the war for the Army Air Force both in recruiting and in reporting accidents.

In conjunction with the recruiting campaign, Arnold established five traveling examining boards in 1938 to cover the nine corps areas.<sup>218</sup> Each board consisted of a pilot, a flight surgeon, and two assistants.<sup>219</sup> The purpose of the boards was to examine applicants on the spot. In the first year, the boards visited sixty-three colleges and universities; the result of these board visits was the addition of 388 qualified candidates for flight training.<sup>220</sup> In the second year, the boards administered 2,369 exams, and 406 candidates passed.<sup>221</sup>

As Chief of the Air Corps in 1940, Arnold was trying to balance training for these candidates with having aircraft for them to fly. The politicians were focusing on producing airplanes. In his memoirs, he recalled meetings with members of the Roosevelt administration in 1940 in which he was “still having a hard time convincing the people in the upper brackets that our training program must expand evenly and be coordinated with our airplane strength.”<sup>222</sup> From Arnold’s perspective, “it was just as essential to have a balanced production of trained combat and maintenance crews as it was to have planes.”<sup>223</sup> Behind his arguments lay the certainty, based on the Air Service’s experience during World War One, of the extraordinarily time-and manpower-consuming nature of flight training.<sup>224</sup>

---

<sup>218</sup> Ibid., 441.

<sup>219</sup> Ibid., 441.

<sup>220</sup> Ibid., 441.

<sup>221</sup> Ibid., 441.

<sup>222</sup> Arnold, *Global Mission*, 205.

<sup>223</sup> Ibid., 205.

<sup>224</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 311.

As early as 1936, the first chief of General Headquarters Air Force (GHQAF), Major General Frank Andrews, voiced his opinion on the readiness and training of the Air Corps in a letter to a friend. He noted: “I am also afraid this shortage of experienced officers is affecting our accident rate, particularly with the pressure of additional training which we are facing in all our wings.”<sup>225</sup> In 1936, the Air Corps was coming off one its worst five-year periods. Between 1931 and 1935, the Air Corps averaged 436 accidents per year resulting in 45 fatalities per year.<sup>226</sup> At the same time, Arnold, as commander of the 1<sup>st</sup> Wing was becoming frustrated with his accident rate and vented some of his frustration in a letter to Andrews:

Airplane accidents have me at my wit’s end....As far as I can see, the only way to stop accidents is to keep all the planes on the ground. Starting with the cadet who, with the whole of March Field to land in, strikes a wing tip against a boundary light.<sup>227</sup>

Later, Andrews would relate to Arnold that he believed the days of walking away from a wreck being a badge of honor were probably over and that the pilots would have to assume more responsibility for their actions.<sup>228</sup>

Such was the situation for the Air Force during the 1920s and 1930s. With changes in aviation technology coming so rapidly, the organization created procedures as it went along. For the men involved, experience such as Foulois teaching himself to fly made it seem that throughout most of the interwar period the most effective way to learn was by doing. Even after standardized procedures were developed, the training of pilots was, according to Arnold, more

---

<sup>225</sup> Copp, *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*, 308.

<sup>226</sup> United States Army Air Forces, Office of Statistical Control, *Army Air Forces Statistical Digest: World War II*, 313, 308.

<sup>227</sup> *Ibid.*, 308-309.

<sup>228</sup> *Ibid.*, 309.



along the lines of a guild.<sup>229</sup> Throughout the interwar period, the Air Force trained pilots at a pace that, if not leisurely, was surely not rushed.<sup>230</sup> At the same time, the prewar Air Corps was not devoid of concern for safety, but the nature of flying ensured that the pilots, while not reckless, accepted a level of risk as being inherent in their profession. General Noel Parrish, a prewar pilot and wartime instructor, summed it up as a “very risky life.”<sup>231</sup> Nonetheless, in 1939, the Air Corps was on the cusp of an expansion program that would require a massive bureaucracy to train tens of thousands of pilots and aircrews for World War Two. As Arnold concluded after the United States entered the war, “we may not have had a powerful air force but we knew that we soon would have one. We had the plans, and our organization was growing every hour.”<sup>232</sup> Because of their interwar experience, the men of the Air Corps accepted that accidents and fatalities would be inevitable as the Air Corps expanded. However, what they would not be able to accept was the scale of the accidents and fatalities.

---

<sup>229</sup> Henry Harley Arnold and Ira Clarence Eaker, *This Flying Game*, 3d ed. (New York, London: Funk & Wagnalls Company, 1943), e. 327.

<sup>230</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 301.

<sup>231</sup> Parrish interview by Hasdorff, 34.

<sup>232</sup> United States. Army Air Forces and Henry Harley Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War* (Washington DC: 1944), 2.

## Chapter 3 - Selecting the Aircrews

We must know that any applicant will develop into the type of man we would like to associate with for the remainder of our military service as brother officers.<sup>233</sup>

Medical examiner on the purpose of the oral interview. *This Flying Game.*

On 28 September 1938, President Roosevelt called a meeting of the Secretary of the Army, Secretary of the Navy, Chief of Staff of the Army, Chief of Naval Operations, Secretary of the Treasury and Hap Arnold as acting Chief of the Air Corps to discuss events in Europe. The purpose of the meeting was how best to prepare for the likelihood that America would get involved in a war in Europe. During the meeting, Roosevelt informed Arnold that he wanted to expand the Air Corps by 10,000 planes at a time when the Air Corps budgeted for only 178 planes in FY 1940.<sup>234</sup> Over the coming months the 10,000 number would grow as the president demanded more of the aircraft industry; the number would peak in 1944 when over 90,000 aircraft of all types were produced. However, that was in the future. Arnold's immediate concern was how to expand the Air Corps in 1938.

As pleased as he was with the increased number of aircraft the president had authorized, Arnold was concerned that neither the president nor the public understood the infrastructure that

---

<sup>233</sup> Henry Harley Arnold and Ira Clarence Eaker, *This Flying Game*, 3d ed. (New York, London: Funk & Wagnall's Company, 1943), 108.

<sup>234</sup> Thomas M. Coffey, *Hap: The Story of the U.S. Air Force and the Man Who Built it: General Henry H. "Hap" Arnold* (New York: Viking Press, 1982).184. Prior to 1976 the fiscal year ran from 1 July to 30 June.

would be necessary to support such an expansion.<sup>235</sup> Arnold recalled in his memoirs that he was “having a hard time convincing the people in the upper brackets that our training program must expand evenly and be coordinated with our airplane strength.”<sup>236</sup> Some officers in the Air Corps anticipated that matching up planes and pilots might be a problem. However, in 1934, Carl Spaatz, as the chief of the Training and Operations Division, believed the problem would be too few airplanes and too many pilots. He predicted that the training of pilots could commence upon mobilization, but there would be a gap between trained pilots and a sufficient number of aircraft for “probably more than a year.”<sup>237</sup> Nonetheless, he also intimated that producing a good pilot was time consuming and costly.<sup>238</sup> Arnold was of the same opinion. Writing in *This Flying Game*, he estimated that “The making of a first-class flying man takes at least two years of instruction and requires an outlay of at least four thousand dollars.”<sup>239</sup> He also testified before Congress, as a young lieutenant, that it did not take long to learn to fly, but it did take a long time to make a “military aviator.”<sup>240</sup> In 1939, during a tour of Air Corps installations with General George C. Marshall, Major General Frank Andrews the Chief of General Headquarters Air Force told Marshall that it took “a year to build an airplane and up to three years to train the crews to

---

<sup>235</sup> Henry Harley Arnold and John W. Huston, *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries* (Maxwell AFB AL: Air University Press, 2002), 74.

<sup>236</sup> Henry Harley Arnold, *Global Mission* (London: Hutchinson, 1951), 205.

<sup>237</sup> Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Air Force History and Museums Programs, 1999), 209.

<sup>238</sup> *Ibid.*, 209.

<sup>239</sup> Arnold and Eaker, *This Flying Game*, 87.

<sup>240</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 77.

operate and maintain that airplane... particularly where aeronautical advancement in types is as rapid as it is today.”<sup>241</sup>

To meet the initial 1939 goal of 24 groups would require the Air Corps to graduate 1,200 pilots by the end of 1940. Based on its peacetime selection and training experience, the Air Corps would have to screen 12,000 applicants. Even then, only 2,200 applicants would be accepted into the training program and of these a little more than half would earn their wings. After the fall of France in 1940, the president raised the number of groups to be manned to 54 with a proportional increase in the number of pilots needed.<sup>242</sup>

By March 1941, the number of groups required had risen to 84 and the number of pilots required annually reached 30,000.<sup>243</sup> These numbers were based on the projected annual production of 36,500 aircraft.<sup>244</sup> In addition, Air Corps planners anticipated heavy losses among planes and crew in combat. In August 1941, the Air War Plans Division prepared a proposal for an extended air campaign against Germany. The plan designated as Air War Plans Division-1 (AWPD-1) included estimates for the operational requirements for this campaign. The planners determined that the attrition rate would require the entire force to be replaced every five months.<sup>245</sup> What they failed to consider was the effect such losses would have on the crews. The Air Staff planners failed to take into consideration not only the psychological effect these losses

---

<sup>241</sup> Frank Andrews quoted in John L. Frisbee, *Makers of the United States Air Force* (Washington DC: Office of Air Force History, U.S. Air Force, 1987), 45.

<sup>242</sup> *Ibid.*, 309.

<sup>243</sup> *Ibid.*, 309.

<sup>244</sup> *Ibid.*, 310.

<sup>245</sup> Haywood S. Hansell, *The Strategic Air War Against Germany and Japan: A Memoir* (Washington DC: Office of Air Force History, U.S. Air Force, 1986), 37.

would have on the crews but also the physical effect on the training base.<sup>246</sup> The Army Air Forces would need to alter its selection process in order to find enough men who were both physically and psychologically up to the test of aerial combat. However, the bigger challenge for the Army Air Forces would be to maintain the same level of quality while producing the requisite quantity. It would force the Army Air Forces to take a hard look at its selection and training process.

Throughout the interwar period, the number of cadets in training never exceeded 500 for primary and 270 for advanced training.<sup>247</sup> This was due in part to the high standards required for acceptance into flight training; these standards had always been rigorous. In 1925 alone, nearly one third of the total applicants failed the physical exam; of the remaining 1,288 applicants, only 362 passed the written entrance examination.<sup>248</sup> Even then, 254 of these men were turned away because there were not enough vacancies in the Air Service.<sup>249</sup> Once a cadet entered training, the odds were still great that he would not earn his wings. During one three-year period, ending in 1927, 1,235 began primary training and only 499 graduated to advanced training.<sup>250</sup> General Noel F. Parrish recalled that of the 96 students in his class only half graduated and fifteen of those who did not graduate had died in accidents during training.<sup>251</sup>

A recent history of the Aviation Cadet Program noted that during World War I an applicant for flight training had to be “under the age of 25, have at least two years of college,

---

<sup>246</sup> Ibid, 92.

<sup>247</sup> Arnold, *Global Mission*, 165.

<sup>248</sup> Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington DC: Office of Air Force History, U.S. Air Force, 1987), 54.

<sup>249</sup> Ibid., 54.

<sup>250</sup> Ibid., 55.

<sup>251</sup> Noel F. Parrish, interview by James C. Hasdorff, (United States Air Force Oral History Program, 10-14 June 1974), 34.

meet rigid physical standards, and be morally sound.”<sup>252</sup> The attributes of “morally sound” were not listed; however, Arnold would later say that the Air Corps needed someone who is “honest, truthful, reliable . . . [and] possesses that *sine qua non, courage*.”<sup>253</sup> The standard remained much the same throughout the interwar period. Describing the application and examination standards in 1936, Arnold used phrases such as “rigidly enforced,” “no exception,” or “absolutely barred” in discussing the standards for acceptance.<sup>254</sup> Arnold noted that there were three phases in the examination process: educational, physical, and psychological. The entrance examination was waived for those who possessed a degree from a “reputable” institution. For those possessing the minimum two years of college education, there was a “stiff mental quiz” to eliminate those who did not have “two years of well-spent college training.”<sup>255</sup> Arnold considered the eye examination the most severe test.<sup>256</sup> The applicant had to have 20-20 vision without the aid of prescription lenses. However, Arnold stated it was the last phase, the psychological exam, that played the greatest role in the selection process.<sup>257</sup> Nonetheless, the pressure of the war required even Arnold to reassess the entrance requirements.

Three days after the attack on Pearl Harbor Arnold held a conference with his staff to determine what changes to the entrance qualifications would be necessary to meet the recruiting goals. After the conference, the following recommendations were recorded in a memorandum for Brigadier General Spaatz, Chief of the Air Staff:

---

<sup>252</sup> Bruce A. Ashcroft, *We Wanted Wings: A History of the Aviation Cadet Program* (Randolph AFB, TX: HQ AETC Office of History and Research, 2005), 1.

<sup>253</sup> Arnold and Eaker, *This Flying Game*, 110.

<sup>254</sup> *Ibid.*, 106.

<sup>255</sup> *Ibid.*, 107.

<sup>256</sup> *Ibid.*, 107.

<sup>257</sup> *Ibid.*, 107.

1) increase the number of aviation cadet examining boards; 2) give wide publicity to the recruitment program; 3) decentralize power to accept or reject aviation cadet applicants by relegating it [the authority to accept or reject applicants] to examining boards and authorizing them to enlist qualified applicants immediately upon acceptance; 4) authorize, as a substitute for the college requirements, use by the examining boards of an examination designed to test intelligence and ability to absorb training center instructions; 5) remove the ban on married applicants for aviation cadet appointment; 6) enlist all successful applicants as aviation cadets and assign them to aircrew training; 7) decide the type of training to be given to each individual after his arrival at an Air Corps replacement training center.<sup>258</sup>

According to Mark K. Wells in *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War*, all countries settled on some combination of physical and psychological standards in pilot selection. Wells also noted that “Eagerness to fly counted for much, as did youth, resolution, tenacity and a willingness to take risks.”<sup>259</sup> One prewar instructor believed that newly inducted cadets made better pilots than those officers who were already in the Army “because they were young, uninhibited, [had] plenty of guts, and [had] no fear.”<sup>260</sup> A postwar study on the traits found in successful fighter pilots supported both positions. The study noted the purpose of the flying schools was to “weed out the incompetent” and insure that the

---

<sup>258</sup> Memorandum for Brig. Gen. Carl Spaatz from Brig. Gen. G. E. Stratemyer, 12 Dec. 1941. Quoted in Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1948), 491.

<sup>259</sup> Mark K. Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War* (Essex, England: F. Cass, 1995), 5.

<sup>260</sup> David V. Miller, interview by James C. Hasdorff, (United States Air Force Oral History Program, 20 September 1985), 12.

new pilots have “measured up to a certain minimum standard of ability and adaptability.”<sup>261</sup> In addition, according to the study, “The qualities of the leader are dependability, stamina, quick judgment, a ‘cool head,’ aggressiveness in the air, and usually superior flying ability. The most important of all these qualities is the ability to make quick judgments and keep a cool head.”<sup>262</sup> In conclusion, the author of the study suggested that “The qualities of the leader are held up as valuable attributes of personality. The man who can be cool and nonchalant in combat is admired and looked up to.”<sup>263</sup> During a 1985 interview, Major General David Miller concurred that as a flight instructor he observed that a cadet with a more “laidback” personality made a better pilot.<sup>264</sup>

Wells also suggests that the Air Corps’ selection process reflected the American “faith in the scientific method of evaluating human capabilities.”<sup>265</sup> For example, those selected as pilots performed well on tests associated with perception and physical reaction, as well the ability to predict mechanical movements and to discriminate among various objects.<sup>266</sup> In addition, they showed an interest and knowledge of aviation before entering training.<sup>267</sup> Not surprisingly, the official Army Air Forces postwar study noted that those selected to be navigators demonstrated proficiency in areas related to the duties required of that crew position, such as an ability to use chart and tables, quick comprehension, strong reasoning ability, and an

---

<sup>261</sup> Robert C. Stone, "Status and Leadership in a Combat Fighter Squadron," *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (March, 1946), pp. 388-394., 388.

<sup>262</sup> *Ibid.*, 391.

<sup>263</sup> *Ibid.*, 391.

<sup>264</sup> Miller, interview by Hasdorff, 12.

<sup>265</sup> Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War*, 6.

<sup>266</sup> United States Army Air Forces, Office of the Air Surgeon, *Stanines: Selection and Classification for Air Crew Duty* (Washington DC: US GPO, 1946), 58.

<sup>267</sup> *Ibid.*



interest in science and math.<sup>268</sup> Some appreciated this process. Retired General Noel Parrish believed in a “pragmatic” approach to selection and training rather than the “mysticism” that held that a pilot either had it or he did not, whatever “it” was.<sup>269</sup>

Prior to 1941, once a candidate was accepted as a flying cadet he was generally able to select the type of training he wanted.<sup>270</sup> With the expansion program, that selection became subject to the needs of the Air Corps and would be determined in a more bureaucratic manner.<sup>271</sup> The test to determine each candidate’s ability was a series of written, psychological and psychomotor tests known as the “classification battery.” A group of “expert professionals,” as they were called in the official history, was assembled to develop and validate this battery of tests.<sup>272</sup>

According to the history of the Army Air Forces Training Command (AAFTC), the first step was a massive analysis of the three key positions, namely, pilot, navigator, and bombardier.<sup>273</sup> According to the official history, the Air Corps collected data from every available source to include “pilots, instructors, aviation cadets, flight surgeons, and others acquainted with aircrew activities and difficulties; and by making exhaustive studies of the ground-school courses which these men had to pass, of the planes they had to fly, and of the instruments and controls they had to read and manipulate.”<sup>274</sup> The study included exit interviews

---

<sup>268</sup> Ibid.

<sup>269</sup> Parrish interview by Hasdorff.

<sup>270</sup> Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1948), 547.

<sup>271</sup> Ibid., 547.

<sup>272</sup> Ibid., 549.

<sup>273</sup> History Army Air Forces Training Command (AFTC) quoted in Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1948), 547.

<sup>274</sup> Ibid., 549-50.

with 1,000 cadets who had been eliminated from training.<sup>275</sup> The fact that a study of this magnitude had not been carried out before lends credence to LeMay's assertion that the prewar Air Corps was more of a "flying club" than a professional organization. It would also address Parrish's desire for a more "pragmatic" approach to pilot training and selection.

Once the call went out, the Air Corps did not have a problem finding a sufficient number of applicants. In FY 1941 nearly three times as many men, 9,272, applied for pilot training as in the proceeding 18 years combined.<sup>276</sup> However, the next year 60 times that number, over 550,000, would apply for flight training.<sup>277</sup> On the other hand, only 26 percent of the 1941 cohort was accepted compared with 52 percent of the 1942 cohort.<sup>278</sup> As Arnold phrased it, the Air Corps was going into "mass-production" of flyers.<sup>279</sup> The Air Corps' recruiting manual took it a step further and compared the training regimen to an "assembly line."<sup>280</sup>

To oversee this "assembly line" after the war broke out, Arnold established a flying training command.<sup>281</sup> This action suggests that Arnold understood that the scale of training the Air Corps was about to begin would require more systematic procedures to insure efficiency in every step of the assembly line. This command, under the supervision of a Major General, was to coordinate all training activities. Moreover, since the Air Corps' ground personnel, from

---

<sup>275</sup> Ibid., 550.

<sup>276</sup> Frederick B. Davis, *The AAF Qualifying Examination*, Vol. Report No. 6 (Washington DC: US GPO, 1947), 4.

<sup>277</sup> Ibid., 4.

<sup>278</sup> United States Army Air Forces, Office of Statistical Control, *Army Air Forces Statistical Digest: World War II* (Washington DC: Office of Statistical Control, 1945), 313.

<sup>279</sup> Arnold and Eaker, *This Flying Game*, 122.

<sup>280</sup> Donald L. Miller, *Masters of the Air: America's Bomber Boys Who Fought the Air War Against Nazi Germany* (New York: Simon & Schuster, 2007), 164.

<sup>281</sup> History AFTC quoted in Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History; 1948).

mechanics to meteorologists, was going to expand proportionally with the rest of the force, the training of these specialties fell under the flying training command to insure uniformity on that assembly line, too. Initial studies indicated that in order to meet the new requirements, the three training centers would have to graduate “455 single-engine pilots, 808 twin engine pilots, 358 cadet bombardiers, 100 observers, and 656 gunners every five weeks, and 133 cadet navigators every six weeks.”<sup>282</sup> The Air Staff decided that it would be impossible for the three existing training centers to meet this output and recommended to Arnold that the Air Corps should establish twenty-eight primary flight, seven basic flight, and eleven advanced flight training centers.<sup>283</sup> Civilian instructors under the supervision of the Air Corps would operate the primary schools. The basic and advanced schools would be operated by the Air Corps. Establishing training centers and producing aircraft were matters of money and will; it would take the expertise of physicians, psychologists, and experienced airmen to insure the Air Corps was selecting the right men.

The Air Corps reported to the War Department that nearly half of its inductees lacked the intelligence required for technical training, and, if this situation was not addressed, its overall mission would be at risk.<sup>284</sup> In order to rectify the problem, the Air Corps sought a ruling from the War Department that 75 percent of the Air Corps’ allotment should consist of men who scored 100, the median score, or better on their Army General Classification Test (AGCT).<sup>285</sup> Despite much debate within the Army over this policy, the Air Corps prevailed and maintained

---

<sup>282</sup> History, Central Flying Training Command (CFTC), AAF Central Flying Training Command History Study No. 63, Apr 1, 1945, Randolph Field TX.

<sup>283</sup> Memorandum to Chief of Staff of the Air Corps, March 26, 1941.

<sup>284</sup> Robert R. Palmer, Bell I. Wiley, and William R. Keast, *The Army Ground Forces: The Procurement and Training of Ground Combat Troops, U.S. Army in World War II* (Washington DC: US GPO, 1948), 10-11, 21-22.

<sup>285</sup> *Ibid*, 10-11.

its higher quota of recruits who scored above the median score on the AGCT.<sup>286</sup> The Air Corps was aided in its recruiting efforts by local fraternal and patriotic organizations. While these organizations were not officially part of the recruiting effort, they acted out of patriotism and, in particular, to the benefit of the Air Corps. For example, the American Legion in New York City worked with the local draft boards to procure the names and addresses of the men classified as 1-A and possessed the necessary educational requirements for flight training.<sup>287</sup> These lists were then passed on to the local Air Corps recruiter.<sup>288</sup>

In early 1941, thirty days prior to induction, the Selective Service System provided lists of qualified registrants to the recruiting headquarters in every state giving Air Corps recruiters time to advise these men of the advantages of becoming an Army Air Corps pilots.<sup>289</sup> In addition, the Air Corps was actively seeking seventeen-year olds, encouraging them to join the Air Corps Enlisted Reserve, but assuring them that they would not be called up until they turned eighteen.<sup>290</sup> Meanwhile, the Navy was seeking young men with the same qualifications to become Naval Aviators. In an effort to undercut the Navy, the Air Corps started a program that allowed local boys to form themselves into “flying cadet units” and remain together through training.<sup>291</sup> However, the Air Corps, knowing that up to 50 percent of the boys would not complete the training, added a caveat that the candidates would remain together “insofar as possible through the later stages of training,” meaning that the Air Corps would do everything

---

<sup>286</sup> Craven *et al.*, *The Army Air Forces in World War II*, 541.

<sup>287</sup> United States Army Air Forces, *Army Air Forces Historical Study no 15: Procurement of Aircrew Trainees* (Maxwell Field, AL: US Army Air Forces, 1944), 35-38.

<sup>288</sup> *Ibid.*, 35-38.

<sup>289</sup> *Ibid.*, 35-38.

<sup>290</sup> Marvin L. Skelton, *Memoirs of a World War II Pilot* (Manhattan KS: Military Affairs/Aerospace Historian, 1978), a. 450. Recruiting Flyer, 49b.

<sup>291</sup> History of Central Flying Training Command, 246.

possible to keep those in training together; however, if one of them was washed out he would be eligible for “other positions in the Air Corps.”<sup>292</sup>

The first gate was the physical examination. According to Arnold, only one in five passed the physical examination.<sup>293</sup> Most of the candidates concurred with Arnold. In their opinion, the flight physical was the most stringent part of the selection process.<sup>294</sup> Nevertheless, perhaps due to wartime demands, one cadet recalled that only twenty percent of his group was washed out by the end of the physical exam.<sup>295</sup> Arnold claimed that there was no physical norm or ideal other than a “normal, healthy body, plus a normal, alert mind.” He emphasized that it was not necessarily the “athletic” type that the Air Corps was looking for “since the flying type is possessed of a particularly fine coordination of mind and muscle.”<sup>296</sup> However, Arnold went on to say that “Few boys who are effeminate or unmanly get called.”<sup>297</sup> Exactly who would determine who was “unmanly,” or how this was to be done, was not clear but was most likely up to the opinion of the review board.<sup>298</sup>

Following the physical examination, the candidates faced a board of experienced flyers for a very subjective review. Arnold placed great faith in the abilities of these board members to

---

<sup>292</sup> Ibid., 246.

<sup>293</sup> Arnold and Eaker, *This Flying Game*, 109-110.

<sup>294</sup> Charles A. Watry, *Washout!: The Aviation Cadet Story*, 1st ed. (Carlsbad CA: California Aero Press, 1983), 52.

<sup>295</sup> Ibid., 58.

<sup>296</sup> Arnold and Eaker, *This Flying Game*, 109-110.

<sup>297</sup> Ibid., 109-110.

<sup>298</sup> In his 1990 work, *Coming Out Under Fire: The History of Gay Men and Women in World War Two*, Allan Bérubé noted that often the examining boards knew full well they were admitting homosexual men and women into the armed forces. In many cases, sexual orientation was overlooked because of the pressing need for personnel. In other cases, the examiner believed the policy of rejecting homosexuals was unfair and were doing their part to right this wrong. Allan Bérubé, *Coming Out Under Fire: The History of Gay Men and Women in World War Two* (New York: The Free Press, 1990).

discern those qualified to be pilots. This was so much the case that he recalled one “old flying instructor” claiming, “I can observe a boy as he drives a car, plays tennis, or even as he walks across the street, and tell you whether he will make a flier!”<sup>299</sup> At one point, the Air Corps briefly experimented with using the Merton Method of analyzing facial features to assess character to classify pilots.<sup>300</sup> The Chief of the Air Corps allowed the Merton Method to be tested on one flight class in late 1939. The 40 cadets were examined by a Mr. Howard N. Cappel and, using the Merton Method, he would determine which cadets possessed the character traits to be a pilot. None of the cadets were eliminated based on Mr. Cappel’s assessment. However, the cadets were tracked through their training and, after graduation, a final report was issued to the Chief of the Air Corps. The findings included the following:

2. It will be noted that of six selected as unsuitable by Mr. Cappel [the examining official], three were actually eliminated, of four placed on the fence, two were actually eliminated, and of three selected as not likely to qualify, none were eliminated. Eleven students were eliminated for failure in flying.
3. The results obtained indicate that the test is definitely of no value as far better results have been obtained at the Air Corps Training Center.<sup>301</sup>

Nonetheless, the scale of the number of cadets required for the war meant that changes would have to be made, even if not approved officially.<sup>302</sup>

---

<sup>299</sup> Arnold and Eaker, *This Flying Game*, 109.

<sup>300</sup> Memorandum to Chief of the Air Corps, Subject: “The Merton Method,” 27 May 1940. The examination was given by Mr. Howard N. Cappel in December 1939. He compared the facial features of the cadets to pictures of famous pilots such as Eddie Rickenbacker, James Doolittle, and Wiley Post. He then made a determination on the likelihood of the cadet completing training. Nothing in the memorandum indicated what Mr. Cappel’s qualifications were for conducting the test.

<sup>301</sup> *Ibid.*

Whatever the official policy, many times the physical requirements were reduced in practice. For example, John Comer had been rejected by the Air Corps before the war for defective depth perception. When he volunteered in 1941, the examining officer told him that his results were “close enough” and he was accepted into aerial gunner training.<sup>303</sup> In another instance, a prospect was found to be five pounds under weight. The surgeon suggested that the young man eat five pounds of bananas and come right back.<sup>304</sup> After gorging on bananas, the candidate passed the physical and was soon on his way to the classification center for more testing.

Having cleared the hurdle of the physical, the candidate moved on to the Army Air Forces Qualification Examination. The qualification exam was instituted on 15 January 1942 to replace the requirement of two years of college study.<sup>305</sup> This requirement came into effect in 1927; before that, an applicant needed to be only a high school graduate.<sup>306</sup> The education requirement had been an effective tool for screening and managing the number and quality of aircrew training candidates prior to the war.<sup>307</sup> In one instance, the college requirement had an interesting effect. The requirement for two years of college meant that an even more elite group was being selected from among African-Americans. Roscoe Brown a Tuskegee pilot, recalled, “The Tuskegee Airmen were probably the most talented group of African-American men ever

---

<sup>302</sup> United States Army Air Forces, *Army Air Forces Historical Study no 2: Initial Selection of Candidates for Pilot, Bombardier and Navigator Training* (Maxwell AFB AL: United States Army Air Forces Historical Division, 1943), 58.

<sup>303</sup> Miller, *Masters of the Air: America's Bomber Boys Who Fought the Air War Against Nazi Germany*, 163-164.

<sup>304</sup> Skelton, *Memoirs of a World War II Pilot*, 3.

<sup>305</sup> *Ibid.*, 4.

<sup>306</sup> *Ibid.*, 4.

<sup>307</sup> Craven *et al.*, *The Army Air Forces in World War II*.

brought together in one place.”<sup>308</sup> Nonetheless, the number of men, of any race, who could meet that standard, would not have been sufficient to fill the rapidly expanding Air Corps. In order to recruit enough candidates, the requirement could be waved with an acceptable score on the qualification exam.

The Qualification Exam was constructed using three techniques: 1) job analysis, 2) surveying experienced pilots, bombardiers, and navigators, and 3) correlation studies, regression procedures, and factorial analyses.<sup>309</sup> The questions on the Qualification Exam were based on actual training manuals and thus on the skills that would be needed by the aircrews.<sup>310</sup> The intent was to create a situation for the applicant to answer practical questions at his own pace.<sup>311</sup> The first exam consisted of the following areas:

- I. General vocabulary
- II. Reading comprehension
- III. Practical judgment
- IV. Mathematics
- V. Contemporary affairs in aviation and the war
- VI. Mechanical comprehension

The qualifying test judged the applicant’s ability to comprehend directions, and to follow instructions, comprehension of reading and mathematics, knowledge of principles for operating aircraft, problem-solving abilities, and, finally, leadership potential. As one candidate, in a slight understatement, reported, it was “[q]uite an order for a paper and pencil test, but it worked.”<sup>312</sup> In other words, based on his observations, the test did a good job of selecting the best candidates for

---

<sup>308</sup> Roscoe Brown as told to Ann Banks, “Doing Battle on Two Fronts,” *New York Times*, 7 May 1995.

<sup>309</sup> Davis, *The AAF Qualifying Examination*, 31.

<sup>310</sup> *Ibid.*, 6.

<sup>311</sup> *Ibid.*, 7.

<sup>312</sup> Watry, *Washout!: The Aviation Cadet Story*, 191, 9.



flight training. According to another candidate, Eugene Fletcher, after the qualification and physical examinations, the applicants waited an additional three weeks for the results.<sup>313</sup> Two of those weeks were spent in quarantine because one of the cadets had contacted red measles.<sup>314</sup> Fletcher recalled that those not selected for flight training were classified for various ground duties such as photography, meteorology, and communications; and some were even reclassified as enlisted personnel and became mechanics.<sup>315</sup>

However, the exam itself came under scrutiny from the Chief of the Air Staff. In November 1941, Brigadier General Carl Spaatz expressed his belief that the Army Air Forces<sup>316</sup> would have to change its testing methods.<sup>317</sup> He believed that the education requirement was “archaic” and placed “too much emphasis on formal education which may mean nothing and . . . no emphasis on native intelligence which may mean everything.”<sup>318</sup> He directed that the examination be structured in order to find “such youth of the country as may not have had a full two years of formal education at college, but whose intelligence and background (training, experience and otherwise) indicate that they can meet the requirements of a pilot officer in the Army Air Forces.”<sup>319</sup> In addition, many newspapers, such as the *New York Daily News*, ran editorials questioning whether the two years of college ensured that trainees would have the skills needed

---

<sup>313</sup> Eugene Fletcher, *Mister: The Training of an Aviation Cadet in World War II* (Seattle WA: University of Washington Press, 1992), 23.

<sup>314</sup> *Ibid.*, 23.

<sup>315</sup> *Ibid.*, 23.

<sup>316</sup> In June 1941 the Air Corps became the Army Air Forces.

<sup>317</sup> R&R, Chief of Air Staff to A-1 AAF, 15 Nov. 1941.

<sup>318</sup> *Ibid.*

<sup>319</sup> *Ibid.*

by a combat pilot.<sup>320</sup> Many in the Army Air Forces were of the same opinion. David V. Miller, a flying instructor, did not rate education as an indicator of aptitude for flying and singled out Chuck Yeager as an example of a talented pilot the Army Air Forces would have lost just because he did not meet the educational requirements.<sup>321</sup> However, he did believe that intelligence was essential along with a good memory.<sup>322</sup>

Regardless of perceived or real shortcomings, the Army Air Forces determined the qualification examination to be an effective screening tool. For example, the examiners discovered correlation between the reading comprehension score and the success or failure of a cadet in pilot training.<sup>323</sup> The higher the score, the more likely the cadet was to complete the training and earn his wings. After several iterations, in order to verify the validity of the test, an entire group was permitted to continue on to flight training regardless of the individual score on the qualification examination.<sup>324</sup> Only 11 percent of those who failed the exam went on to complete flight training compared with nearly 35 percent of those who passed the exam.<sup>325</sup> Nonetheless, the Army Air Forces was constantly trying to refine the accuracy of the test, and the exam went through seventeen revisions between January 1942 and the end of the war.<sup>326</sup> As a 1947 study put it, “Broadly speaking, the major function of the Qualifying Examination was to select men sufficiently literate to become officers and sufficiently endowed with certain aptitudes

---

<sup>320</sup> New York Daily News, quoted in Charles A. Watry, *Washout!: The Aviation Cadet Story*, 1st ed. (Carlsbad CA: California Aero Press, 1983), 9.

<sup>321</sup> Miller, interview by James C. Hasdorff, 11.

<sup>322</sup> *Ibid.*, 11.

<sup>323</sup> Davis, *The AAF Qualifying Examination*, 7.

<sup>324</sup> *Ibid.*, 2.

<sup>325</sup> United States Army Air Forces, Office of the Air Surgeon, *Stanines: Selection and Classification for Air Crew Duty* (Washington DC:, 1946), [58], 8.

<sup>326</sup> Davis, *The AAF Qualifying Examination*, 9.

to graduate from flying training, especially flying training.”<sup>327</sup> Over one million men took the qualification exam and nearly one third failed.<sup>328</sup>

However, as always, there were exceptions. An airline pilot could receive a reserve commission without undergoing any Army Air Forces training if he had 400 hours of flight time, passed the physical examination, demonstrated flying proficiency, and passed a written test.<sup>329</sup> West Point cadets were a special case. Any cadet who requested flight training and could pass the physical examination was accepted into the program.<sup>330</sup> Initially, these West Point cadets fared poorly compared with the Aviation Cadets. The remedy was to administer the qualification exam to West Point cadets as well and accept only those who made a passing grade. From that point on the West Point cadets’ success was on a par with the aviation cadets.<sup>331</sup> The result was also an unintended validation of the qualification examination as a predictor of success in flight training. Nonetheless, one instructor recalled having a low opinion of the West Point graduates because “They weren’t quite as responsive [to the flight instructors orders].”<sup>332</sup> However, he was quick to add that he did not perceive any bias among the instructors towards the West Point cadets.<sup>333</sup> A final exception was made for exceptionally gifted enlisted personnel. Chuck Yeager

---

<sup>327</sup> Davis, *The AAF Qualifying Examination*, 3.

<sup>328</sup> Ibid.

<sup>329</sup> Maurer, *Aviation in the U.S. Army, 1919-1939*, 432.

<sup>330</sup> United States Army Air Forces, Office of the Air Surgeon, *Stanines: Selection and Classification for Air Crew Duty*, [58], 36.

<sup>331</sup> Ibid., 38-39.

<sup>332</sup> Miller, interview by James C. Hasdorff, 13.

<sup>333</sup> Ibid., 13.

was probably the most famous and successful beneficiary of this program. He originally joined as a mechanic, but he learned to fly through the “Flying Sergeants” program.<sup>334</sup>

After meeting the minimum requirements, aircrew candidates reported to classification centers for an average of three more weeks of testing.<sup>335</sup> They would also face more cuts; 15 percent would be eliminated for physical or other deficiencies.<sup>336</sup> It was also at the classification center that the candidates learned whether they would go on to pilot, navigator, or bombardier training. Between the testing and waiting, the stress was hard on the candidates and the classification centers went out of their way to reassure the candidates why the process was necessary. They were also assured that the process was a means of protecting the interests of the trainees themselves as well as those of the government.<sup>337</sup> However, the cadets were cautioned that all parts of the test, including the psychological examination, were critical to their ultimate classification.<sup>338</sup>

The purpose of the Aircrew Classification Battery, as opposed to the Qualification Examination, was to differentiate among men best suited for training as pilots, bombardiers, navigators, and gunners.<sup>339</sup> It was, in effect, designed to test aptitude for crew positions. For example, the official history of the selection program noted that an applicant who was “careful, accurate, and mathematically inclined might make an excellent navigator but fail to make the

---

<sup>334</sup> Chuck Yeager and Leo Janos, *Yeager: An Autobiography* (Toronto; New York: Bantam Books, 1985), 13. After flight training, Yeager was promoted to Flight Officer. While serving in Europe he received his commission and promoted to Second Lieutenant. He retired from the Air Force in 1975 with the rank of Brigadier General.

<sup>335</sup> History AFTC, 356-357 quoted in Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1983; 1948).

<sup>336</sup> *Ibid.*

<sup>337</sup> *Ibid.*, 552

<sup>338</sup> *Ibid.*, 552

<sup>339</sup> Davis, *The AAF Qualifying Examination*, 4.

grade as a pilot.”<sup>340</sup> The components of this battery were a written exam, a psychomotor test, and a psychological evaluation.

In Summer 1941, the medical division of the Army Air Forces established an experimental program to develop psychological testing instruments that could be used to screen candidates for the desired characteristics.<sup>341</sup> The results of this experiment would become part of the Aircrew Classification Battery. This experimental test was administered to cadets at the replacement centers in order to collect data on the students and to improve the content of the psychological test before it was accepted for use on all applicants.<sup>342</sup> The purpose of this experimental testing was the “development of means [written, verbal, and psychomotor tests] for measuring those aptitudes, special abilities, and psychological characteristics associated with subsequent success or failure of cadets in flight training.”<sup>343</sup> A 1943 bulletin about psychology noted that after each class completed training a thorough analysis of the test instrument was conducted to “determine which tests should be retained as predictive devices for the selection and classification of future classes.”<sup>344</sup> Based on this limited testing, on 8 December 1941, Arnold directed the medical division to begin using these new testing procedures — the written, verbal, and psychomotor tests — to screen candidates.<sup>345</sup> Not all of the tests had been validated,

---

<sup>340</sup> United States Army Air Forces, Office of the Air Surgeon, *Stanines: Selection and Classification for Air Crew Duty*, [58], 8.

<sup>341</sup> History AFTC, 336-337 quoted in Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1948).

<sup>342</sup> *Ibid.*

<sup>343</sup> “The Aviation Psychological Program of the Army Air Forces,” *Psychological Bulletin*, Vol 40 (Dec 1943), 759-769.

<sup>344</sup> *Ibid.*

<sup>345</sup> History AFTC, 338-340 quoted in Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1983; 1948).

but the medical officers believed that enough data had been collected to “permit early conversion from a peacetime and experimental project to a wartime classification system.”<sup>346</sup>

The psychomotor test, according to the official history, “sought to measure such characteristics as steadiness, balance and equilibrium, reaction time, and ability to think clearly and read directions under conditions of confusion.”<sup>347</sup> The testing involved jigsaw puzzles and various mechanical devices that were manufactured for the sole purpose of carrying out this testing.<sup>348</sup> However, delays in the production of psychomotor testing equipment along with the very large number of men to be tested forced many classification centers to improvise what historian Mark Wells later called “locally devised tests of questionable value.”<sup>349</sup> Moreover, some candidates doubted the efficacy of at least a few of these locally generated stopgaps.

In recounting his experience as an aviation cadet in *Washout*, Charles Watry goes into detail about one particular test. In the test, he was told to hold a pencil-thin rod inside a hole in a metal plate without touching the sides of the hole. Unfortunately, there was a universal joint in the middle of the rod that caused the rod to twist and bend making it impossible to hold the rod without touching the sides. Whenever the rod touched the side, it would complete a circuit and a green light would come on. Watry recalled that the lights were positioned so that the cadet was aware of how many errors he had made.<sup>350</sup> The examiner then tallied the number of times the light came on for a final score and sent the cadet on to the next, in Watry’s words, “demonic

---

<sup>346</sup> Ibid, 338-340.

<sup>347</sup> History AFTC, 338-40 quoted in Wesley Frank Craven et al., *The Army Air Forces in World War II* (Washington DC: Office of Air Force; 1948)

<sup>348</sup> Craven et al., *The Army Air Forces in World War II*, 489.

<sup>349</sup> Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War*, 7.

<sup>350</sup> Watry, *Washout!: The Aviation Cadet Story*, 50.

psychomotor test.”<sup>351</sup> Watry noted that if the test itself was not stressful enough, the examiners induced their own form of stress. As Watry recalled, one of the examiners was constantly berating, cajoling, or harassing the cadet throughout the test.<sup>352</sup>

On the other hand, the examiner was not always an expert and in some instances had no more experience than the candidates. These examiners were often hard pressed to process the number of candidates coming through the classification centers. One examiner, Private A. Jack Jernigan, was pulled from his basic training class and became a psychomotor test administrator because he had a bachelor’s degree in education.<sup>353</sup> Jernigan was assigned to the testing unit on a Tuesday and was expected to begin administering the test on Friday. By his own admission, he did not fully understand the tests, but he dutifully administered them.<sup>354</sup> In addition, at times he felt overwhelmed by the magnitude of the task. Jernigan recalled testing, on average, over five hundred men every day.<sup>355</sup> During a five-week period in late 1943, nearly 14,000 enlisted men were administered the psychomotor exam at the testing center in Miami.<sup>356</sup> Of the 14,000 men tested, nearly 6,000 were disqualified or failed some portion of the exam.<sup>357</sup> The number and pace apparently took its toll on Jernigan himself. In a letter home he lamented, “I’m tired of sitting here seeing these young kids come through preparing to fight.”<sup>358</sup> Nonetheless, he

---

<sup>351</sup> Ibid., 51.

<sup>352</sup> Ibid., 50-52.

<sup>353</sup> A. Jack Jernigan, *Selecting the Best: World War II Army Air Forces Aviation Psychology* (Bloomington, IN: 1stBooks, 2003), 11.

<sup>354</sup> Ibid., 16.

<sup>355</sup> Ibid., 56.

<sup>356</sup> Ibid., 16.

<sup>357</sup> Ibid., 76.

<sup>358</sup> Ibid., 76.

pragmatically concluded, “I would like to fight, but I would hate to be killed. Guess I will stay here.”<sup>359</sup>

After the physical exam, the psychological evaluation was the most critical factor in determining the suitability of an applicant. Approximately 10–15 percent of cadets failed the psychiatric interview.<sup>360</sup> According to Arnold, the psychological exam was to determine if the “bewildered applicant” possessed a “normal, healthy mind, reflexes, aspirations, and inhibitions.”<sup>361</sup> The applicant was asked a series of questions about his family history and he had to “know the history of each [family member] from birth to the present time.”<sup>362</sup> A medical examiner summed up the purpose of the psychological evaluation this way: “We must know that any applicant will develop into the type of man we would like to associate with for the remainder of our military service as brother officers.”<sup>363</sup> Moreover, in his official report to the Secretary of War, Arnold paid tribute to the program:

The Aviation Psychology program paid off in time, lives, and money saved, and through its selection of the raw material has aided in the establishment of an effective combat air force. This has been done at a total cost of less than \$5 per candidate tested.<sup>364</sup>

---

<sup>359</sup> Ibid., 42.

<sup>360</sup> Mark K. Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War* (Essex, England: F. Cass, 1995), 8.

<sup>361</sup> Arnold and Eaker, *This Flying Game*, 107.

<sup>362</sup> Ibid., 108.

<sup>363</sup> Ibid., 108.

<sup>364</sup> United States Army Air Forces and Henry Harley Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War* (Washington DC: US GPO, 1944), 88.



However, the official medical history of the US Army in World War Two concluded that the psychiatric testing could best be labeled “intuitive and haphazard.”<sup>365</sup>

Results from the Aircrew Classification Battery were weighted and combined in a manner to produce composite aptitude ratings.<sup>366</sup> These were grouped into three categories designed to predict graduation or elimination from pilot, bombardier, or navigator training.<sup>367</sup> The test was accurate enough to determine the potential for success by score. An applicant who scored a nine on the test had only a four percent chance of washing out.<sup>368</sup> On the other hand, an applicant who scored a one had a 77 percent chance of washing out.<sup>369</sup> The scores became known as the “stanines,” a contraction of the words “Standard nine.”<sup>370</sup> This score was very important to the Air Force as well as to the individual.

Those who did not score well on the Aircrew Classification Battery were considered the “poorest investments” as aircrew. Based on their stanine scores these individuals were still considered assets to the Army Air Forces and were selected for other categories, such as mechanics, where the chances of “a good return on the investment were greater.”<sup>371</sup> The scores also indicated a strong relationship between interest and success among pilot, bombardier, and navigator candidates.<sup>372</sup> However, at times, the needs of the Army Air Forces came first and

---

<sup>365</sup> United States. Air Force Medical Service, Mae Mills Link and Hubert Anderson Coleman, *Medical Support of the Army Air Forces in World War II* (Washington DC: Office of the Surgeon General, USAF, 1955), 1027.

<sup>366</sup> Davis, *The AAF Qualifying Examination*, 3.

<sup>367</sup> *Ibid.*, 3.

<sup>368</sup> United States Army Air Forces. Office of the Air Surgeon, *Stanines: Selection and Classification for Air Crew Duty*, [58], 10.

<sup>369</sup> *Ibid.*, 10.

<sup>370</sup> *Ibid.*, 10.

<sup>371</sup> *Ibid.*, 16.

<sup>372</sup> *Ibid.*, 22-25.

some cadets whose stanine scores indicated that they would have been best suited for navigator or bombardier training were assigned to pilot training.<sup>373</sup> Not surprisingly, they were eliminated from flight training at twice the rate of those whose scores indicated they were best suited for pilot training.<sup>374</sup>

Even in operational training, the stanine continued to be a predictor of success and those with higher scores went on to be airplane commanders at disproportionately higher rates than those who had lower scores.<sup>375</sup> However, data from the field indicated that performance there correlated less with predicted ability and more with the pilot's passion for flying at the job at hand.<sup>376</sup> The stanine score was also an indicator of a propensity for "pilot error" accidents. The higher the stanine score, the less likely a pilot would be involved in an accident attributable to "pilot error."<sup>377</sup> The study also indicated that the higher stanine scores translated into better gunnery scores as well.<sup>378</sup>

By raising or lowering the minimum stanine score for each crew position, the Army Air Force could adjust the supply of aircrew and "meet the needs of the moment," according to the official history.<sup>379</sup> Early in the war, when the need for aircrews was critical, the minimum scores were lower. For example, in 1942, the minimum score for acceptance into pilot or bombardier training was three, but after 1944, when the need was less severe, the minimum score was raised

---

<sup>373</sup> Ibid., 30.

<sup>374</sup> Ibid., 42.

<sup>375</sup> Ibid., 43-44.

<sup>376</sup> Donald W. Hastings *et al.*, *Psychiatric Experiences of the Eighth Air Force: First Year of Combat (July 4, 1942-July 4, 1943)* (New York, NY: Prepared and distributed for the Air Surgeon, Army Air Forces by the Josiah Macy, Jr. Foundation, 1944), 46-47.

<sup>377</sup> Ibid., 46-47.

<sup>378</sup> Ibid., 48-49.

<sup>379</sup> Ibid., 4.

to six and in 1945 it was raised to eight for bombardiers.<sup>380</sup> Prior to 1943, there were three other factors in aircrew training assignments; the priorities were aptitude, individual preference, and availability.<sup>381</sup> After 1943, with smaller quotas to fill, the priority shifted to availability, aptitude, and individual preference.<sup>382</sup>

On the other hand, reports from the field indicated that, at times, the screening might have been less than successful. In sixty individual cases studied by the Eighth Air Force medical staff, twenty were categorized as “psychological failures” before they flew only a single mission.<sup>383</sup> The report went on to rebuke these individuals: “. . .it can be stated that these men were not highly motivated with regard to the war. These men let the instinct of self-preservation outweigh their sense of duty and by means of symptoms made a separate peace with the enemy.”<sup>384</sup> In one example, it was an experienced pilot with 2,300 flying hours and had spent time as an instructor in the Royal Canadian Air Force before the United States entered the war. Nonetheless, he “broke” before his first mission. As noted in an Eighth Air Force report:

Captain, Pilot, B-17. Chief complaint: “Scared to death.” The officer states that he never had any particular trouble until the time came for his first combat mission. On being alerted for this mission, he states that he became scared and frightened, began to tremble, felt like running away to hide, and he states that he realized the entire trouble was due to fear of being killed . . . No other family history of insanity or nervous breakdown . . . He stated that he realized this might be

---

<sup>380</sup> Ibid., 48-49.

<sup>381</sup> History of Central Flying Training Command, 335.

<sup>382</sup> Ibid., 335.

<sup>383</sup> Donald W. Hastings *et al.*, *Psychiatric Experiences of the Eighth Air Force: First Year of Combat (July 4, 1942-July 4, 1943)* (New York, NY: Prepared and distributed for the Air Surgeon, Army Air Forces by the Josiah Macy, Jr. Foundation, 1944), 40.

<sup>384</sup> Ibid., 40.

considered as a court martial offense, but that he could not force himself to go on a combat mission and was ready to accept any consequences . . . .<sup>385</sup>

The surgeon further noted that “No other . . . history of mental illness in his family.” The implication being that the Captain’s actions were indicative of some mental illness. This case was disposed of as follows:

. . . Fear Reaction . . . may be considered as a “predisposed” individual. This officer was returned to his unit by the Central Medical Board as fit for full flying duties . . . the officer resigned his commission for the good of the service when he met the Theater Reclassification Board.<sup>386</sup>

The Army Air Forces referred to this condition as “operational fatigue.”<sup>387</sup> In evaluating an airman’s predisposition to succumb to operational fatigue, one of the indicators the Eighth Air Force surgeons determined was fear of physical dangers evidenced by “failure to participate in tough or ‘blood’ sports.”<sup>388</sup>

What seems to have been the biggest difference in stress between those pilots in training and those engaged in combat operations was the focus of their fear. The memoirs of the trainees suggest that fear of being eliminated that was their overriding concern. Once in theater the fear

---

<sup>385</sup> Quoted in *Ibid.*, 178.

<sup>386</sup> *Ibid.*, 178.

<sup>387</sup> Hastings *et al.*, *Psychiatric Experiences of the Eighth Air Force: First Year of Combat (July 4, 1942-July 4, 1943)*, 40.

<sup>388</sup> *Ibid.*, 120. The idea that moral character was linked to physical activity was not new. This link had been widely debated in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. For example, in 1910, William James wrote an essay, “The Moral Equivalent of War,” suggesting that society would be better served by sending the youths of America to “coal and iron mines. . . to foundries and stoke-holes. . . to get the childishness knocked out of them.” A more in-depth study of the topic was done in 1983 by Donald J. Mrozek in *Sport and American Mentality, 1880–1910*.

shifted to survival. There it affected each individual differently. A 1944 study of the Eighth Air Force's first year in combat indicated three phases when fear and stress set in. For some the fear was greatest after arriving at their base and realizing that they were replacing men who had been lost in combat. The next was during the first five missions when the crew would have experienced most, if not all, of the hazards of flying bombing missions over Germany. For example after his fifth mission a navigator began showing signs of "operational fatigue."

Second Lieutenant, 412 Bombardment Squadron. This 29-year-old navigator had five combat missions. He was performing satisfactorily until he was wounded in the right arm when his plane was badly damaged on the fifth mission. He was hospitalized for three weeks, developed marked tension symptoms, was unable to perform his duties on subsequent practice missions and asked to be grounded. He was found to be tense, depressed and to show evidence of weight loss. He had an excellent record, went to college for two years, held good jobs, was well motivated towards flying and did well as a navigator.<sup>389</sup>

The Lieutenant was eventually dismissed from the service with an "other than honorable" discharge.<sup>390</sup> The last phase was referred to as "operational fatigue" and typically set in between the twelfth and sixteenth missions.<sup>391</sup>

The report concluded: "It seems doubtful if the natural stress of flying training and peacetime flying or if any artificial set of tests can be relied upon to eliminate the men who will have insufficient emotional tolerance to combat flying."<sup>392</sup> However, the Eighth Air Force

---

<sup>389</sup> Quoted in Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War*, 177.

<sup>390</sup> *Ibid.*, 177.

<sup>391</sup> Hastings *et al.*, *Psychiatric Experiences of the Eighth Air Force: First Year of Combat (July 4, 1942-July 4, 1943)*, 158.

<sup>392</sup> *Ibid.*, 159.

surgeons made two recommendations to weed out those unfit for combat flying before they began flight training. The first was to train all prospective candidates as air gunners and then deploy them to theater for five missions.<sup>393</sup> Those who performed well would be sent back to the states for flight training.<sup>394</sup> The other was to have the candidates make five parachute jumps to test their physical courage.<sup>395</sup> However, the surgeons readily admitted that neither of these recommendations was practical nor effective.<sup>396</sup>

Despite the fact that these men—the pilots, navigators, bombardiers, and air gunners—had broken down mentally under the rigors of combat, the Eighth Air Force surgeons concluded that “They are usually vigorous, aggressive, persistent, and healthy in body.”<sup>397</sup> In other words, the Army Air Forces had gotten exactly what it had screened for. What it could not predict was the reaction of these young men to the stresses of combat. Nor could this be replicated in training.<sup>398</sup>

Before going on to flight training the candidate had undergone a trying experience during the qualification and classification process. It was an experience that did not exist before the war and one that only came about after the Army Air Forces staff determined that it needed a more effective and scientific method for selecting aircrews. In the end, the selection process worked very well. In 1942, John Steinbeck was commissioned by the Army Air Forces to write a book

---

<sup>393</sup> Ibid., 158-159.

<sup>394</sup> Ibid., 158-159.

<sup>395</sup> Ibid., 159.

<sup>396</sup> Ibid., 159.

<sup>397</sup> Ibid., 46.

<sup>398</sup> As to be expected casualties were higher in combat than in training. Nearly 40 percent more pilots and aircrews died in combat than in training. United States Army Air Forces, Office of Statistical Control. *Army Air Forces Statistical Digest: World War II*. Washington DC: Office of Statistical Control, 1945, 49.

on flight training, *Bombs Away: The Story of a Bomber Team*. In the book, Steinbeck noted that the Army Air Forces was recruiting “the best physical and mental specimens the country produces.”<sup>399</sup> However, this was only the beginning, and the new cadet faced ever-increasing challenges during the next four phases of flight training. These challenges would not only test his ability but at times could cost him his life.

---

<sup>399</sup> John Steinbeck, *Bombs Away: The Story of a Bomber Team*, 2nd ed. (New York: Penguin Books, 2009), 13.

## Chapter 4 - Training the Aircrews

A fighter pilot is a combination of a mathematician and an athlete, a scientist and a sharpshooter. He's got to know what goes on inside his plane. The heart of his fighter is steel and copper; its bloodstream is gas and oil. But its brain is the man who flies it.<sup>400</sup>

Captain Ronald Reagan, *Wings for this Man*

Expediency dictated that peacetime perfection must give way to minimum standards of proficiency....<sup>401</sup>

*Army Air Forces Historical Study, No. 18*

Having selected the "best physical and mental specimens," the Air Corps had to train these men for combat. The trade-off was to balance the rigors and structure necessary for precision flying with the personality types which the Air Corps had pursued. In general, as Rebecca Cameron note in *Training to Fly*, these men "tended to be cocky, individualistic, high-spirited young men exhilarated by the drama and show."<sup>402</sup> However, the purpose of military training is to produce competent soldiers or, in this case, airmen, and this kind of training does not necessarily contain much "drama and show." A postwar study on the adjustment of recruits to military life concluded: "The military service has reduced every phase of the training process

---

<sup>400</sup> Captain Ronald Reagan, *Wings for this Man*, Army Air Forces Special Film Project 151, 1945.

<sup>401</sup> United States Army Air Forces, *Army Air Forces Historical Study, No 18: Pilot Transition to Combat Aircraft* (Maxwell AFB AL: United States Army Air Forces Historical Division, [1944]), 38.

<sup>402</sup> Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Air Force History and Museums Programs, 1999), 272.



to its simplest elements and then standardized them.”<sup>403</sup> The intent of this simplification was that the soldier could easily learn the elements of his technical skill and, even more importantly, so that the soldier could “then act in concert with others in its application.”<sup>404</sup> Almost every phase of training during World War Two emphasized the importance of teamwork. According to the previously mentioned postwar study, if the “slowest learner cannot keep up with the group in the training process [,] he is soon eliminated as being inapt, incapable, or maladjusted.”<sup>405</sup> However, as noted in the previous chapter, the Air Corps, through its rigorous selection process, believed it had eliminated the “inapt, incapable, or maladjusted” by the time the new cadets began training.

Nonetheless, these “cocky, individualistic, high-spirited young men” were presented with a structured sequential method of instruction that had served the Air Corps well throughout the interwar period. The instructor would explain a maneuver, and then demonstrate it. Then the student would execute it while the instructor observed. After observing the student execute the maneuver to his satisfaction, the instructor would then let the student practice on his own.<sup>406</sup> Throughout the process, there would be periodic checks by supervisors and a final check at the end of the stage that “tested the ability of the student to operate the airplane under all required conditions.”<sup>407</sup> However, Arnold cautioned that there was a brief period in flight training when a

---

<sup>403</sup> August B. Hollingshead, "Adjustment to Military Life," *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar. 1946), pp. 439-447.

<sup>404</sup> *Ibid.*, 441.

<sup>405</sup> *Ibid.*, 441.

<sup>406</sup> United States Army Air Forces, Training Command, *Primary Flying: Instructors Manual* (Fort Worth TX: US Government, 1944), 111.

<sup>407</sup> Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1948), 575.

cadet “becomes overconfident and knows more about flying than he will ever know again.”<sup>408</sup>

Arnold considered this the most dangerous period in a pilot’s career, but was optimistic because “A crash or near crash usually brings him back to normal....”<sup>409</sup> Perhaps this was an acceptable attitude during peacetime, but how many crashes to bring a pilot “back to normal” could the Air Corps afford when it had to produce a large number of pilots in a short amount of time? More importantly, could the Air Corps maintain that attitude when the nation had called for thousands of sons, brothers, and husbands to undergo flight training?

In 1936, the program of instruction for flight training called for eight months in primary flight training followed by four months in advanced training. At the end of one year, the cadet would have accumulated 250 hours of flight time.<sup>410</sup> In 1935, the Chief of Training and Operations, Lieutenant Colonel Carl Spaatz, recommended that the length of training be extended to sixteen months in order to produce a well-rounded pilot.<sup>411</sup> From there he would undergo another year of training with a tactical squadron where he would acquire another 250–300 hours of flight time to include flying at night and in inclement weather.<sup>412</sup> Following this second year, if his squadron commander recommended him, the cadet would be offered a reserve commission and another year on active duty.<sup>413</sup> Arnold referred to the third year of training as

---

<sup>408</sup> Henry Harley Arnold and John W. Huston, *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries* (Maxwell AFB AL: Air University Press, 2002), 101

<sup>409</sup> Henry Harley Arnold and Ira Clarence Eaker, *This Flying Game*, 3d ed. (New York, London: Funk & Wagnall’s Company, 1943), 101.

<sup>410</sup> *Ibid.*, 112-113.

<sup>411</sup> *History of the Army Air Forces Pilot School (Specialized VHB)*, Randolph Field TX, Eighth Bimonthly Supplement, 1 May 1945 – 1 July 1945, (Randolph Field TX, 1945), 109

<sup>412</sup> *Ibid.*, 116.

<sup>413</sup> *Ibid.*, 116.

the “postgraduate phase.”<sup>414</sup> Arnold also believed that the two-year training program had both “educational and cultural value.”<sup>415</sup> A postwar study emphasized the point about culture, noting that “The new member [of the squadron] must learn the elaborate terminology of flying and combat. Without this vocabulary one is not a bona fide member of the group.”<sup>416</sup> Arnold went on to conclude: “[T]hose who survive [flight training] for two years emerge men.”<sup>417</sup> With the expansion of the program in 1939, the Air Corps faced the problem of how to train and prepare pilots to “emerge [as] men” in a much shorter period.

A training directive for 1939–1940 laid out the requirements for the expansion program. First priority was given to individual and specialized training over the training of collective units.<sup>418</sup> General Frank Andrews, the commander of the General Headquarters Army Air Forces (GHQAAF), emphasized the priorities in training in late 1939 when he stated: “At this phase of the Air Corps expansion, unit tactical training has had to give precedence to individual training of pilots and mechanics. As soon as our training resources permit, we will return the emphasis to tactical combat training.”<sup>419</sup> In addition, despite the loss of life and aircraft due to a lack of proficiency in navigation and in flying in inclement weather just a few years earlier during the

---

<sup>414</sup> Ibid., 117.

<sup>415</sup> Ibid., 117.

<sup>416</sup> Robert C. Stone, “Status and Leadership in a Combat Fighter Squadron,” *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar, 1946), pp. 388-394.

<sup>417</sup> Arnold and Eaker, *This Flying Game*, e. 327, 119.

<sup>418</sup> Memo to Commanding Generals of the Four Armies, Commanding Generals all Corps Areas and Departments, Commanding General GHQ AAF, Commandants General and Special Service Schools, Superintendent U.S. Military Academy, Chief all Arms, Services, and Bureaus of War Department, and Executive Reserve Affairs, Subject: Air Corps Training, 1939-1940.

<sup>419</sup> Speech, Major General Frank M. Andrews, 27 November 1939, quoted in Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Air Force History and Museums Programs, 1999), 307-308.

airmail crisis, time for both was reduced “to that required to maintain individual proficiency.”<sup>420</sup> Even Arnold noted the difficulty in mastering flying by instruments. He stated that it took “from fifteen to thirty hours of instruction to impart to an old and well trained flier the essentials of this new method.”<sup>421</sup> In addition, the length of the entire process of flight training was shortened to nine months from the previous twelve.<sup>422</sup> While all phases of training were reduced, most of the cuts came from basic military training and ground school flight training.<sup>423</sup> Nonetheless, eventually five hours were cut from primary flight training, the training phase that was the cadet’s first exposure to flying an airplane.<sup>424</sup> More telling was the fact that initially the hours cut from both basic (the training phase after primary) and advanced flight training came from cross-country navigation.<sup>425</sup> These hours would be added back to the curriculum after reports from the field indicated that the pilots coming out of flight school were deficient in this skill.

After 1 July 1939, new classes were entering training every six weeks to begin the new twelve-week primary course.<sup>426</sup> However, as President Roosevelt kept increasing aircraft production and the size of the Air Corps, the training base had to reduce the training time if the production of aircrews was to keep up with the production of aircraft. In May 1940, the primary flight-training course was reduced to ten weeks and after America entered the war it was reduced

---

<sup>420</sup> Ibid, 308.

<sup>421</sup> Henry Harley Arnold and Ira Clarence Eaker, *This Flying Game*, 3d ed. (New York, London: Funk & Wagnall’s Company, 1943), 99.

<sup>422</sup> Directive on the Air Corps Expansion Program, 18 April 1939.

<sup>423</sup> Craven *et al.*, *The Army Air Forces in World War II*, 458.

<sup>424</sup> Ibid., 458

<sup>425</sup> Ibid., 458.

<sup>426</sup> History of Army Air Forces Training Command, 510-512 quoted in Craven *et al.*, *The Army Air Forces in World War II*, 458.

to nine weeks.<sup>427</sup> Despite the cuts in total time for training, the number of flight hours required for graduation never dropped below 60.<sup>428</sup> Instead, the time was taken from ground school. The number of hours devoted to ground school went from 225 in 1939 to 84 in mid-1942.<sup>429</sup> At a later point in the war, in an effort to trim more time from the training program, the Army Air Force took graduates from the Civilian Pilot Training Program (CPTP) and advanced them to basic flight training, skipping primary. The CPTP was a New Deal program that was intended to boost the light aviation industry by encouraging young men and women to learn to fly. As an aviation cadet and a future general, David V. Miller was part of that experiment. In an interview in 1974, he stated that he believed that it had been a mistake for his class to skip primary training, and he also thought this had been the reason why 41 of his class of 52 had been washed out of basic flight training. What they had missed, in Miller's opinion, was the enculturation process that took place during primary flight training.<sup>430</sup>

It should be noted that within a two-year period, 1939-1941, the Air Corps expanded from two training facilities to 45; the number of available training aircraft then increased from 400 to 2,700 at these facilities before the manufacturing base could produce more aircraft; and, in addition, the training personnel increased from 3,300 to 37,000.<sup>431</sup> Moreover, the Air Corps expanded the scope of the training program. For example, for most of the interwar period, the training of bombardiers, navigators, and gunners had been the responsibility of the tactical

---

<sup>427</sup> Ibid, 458.

<sup>428</sup> Ibid., 458.

<sup>429</sup> Ibid., 458.

<sup>430</sup> Major General David V. Miller, interview by James C. Hasdorff, (United States Air Force Oral History Program, 25 September 1985) 10-14.

<sup>431</sup> Craven *et al.*, *The Army Air Forces in World War II*, 476.

units.<sup>432</sup> As part of the expansion program, Air Corps established specialized schools to teach these necessary skills.<sup>433</sup> In addition, the Air Corps began training pilots from other countries. As the official history notes, “The Training and Operations Division had to provide additional facilities, equipment, and personnel for the British pilot-training program, which was itself four times the size of the entire Air Corps pilot-training program prior to 1939.”<sup>434</sup> By 1942, to accommodate this influx of personnel, foreign and domestic, the Army Air Forces had eight new flying schools, two gunnery schools, and five cadet reception stations in operation.<sup>435</sup>

In 1941, in a personal letter to the chief of the training division, the commander of Moffett Field bemoaned the fact that flight training had been reduced to 200 hours from the previous 325.<sup>436</sup> However, beyond his concern over the reduction in training hours, he was more concerned that the Air Corps was not going to produce an equally proficient pilot or military officer in 30 weeks in what took a full year before the expansion program.<sup>437</sup> The official history freely admits that under “wartime pressure to produce pilots” military training got short shrift.<sup>438</sup> One student also believed the accelerated pace of training deprived the Air Corps of some very capable pilots. The student concluded: “The reality of flight training in wartime was that some cadets who could have been taught to be perfectly competent pilots, if the instructors had

---

<sup>432</sup> Ibid., 476.

<sup>433</sup> Ibid., 476.

<sup>434</sup> Ibid., 467.

<sup>435</sup> Ibid., 467.

<sup>436</sup> Memorandum on Changes to Training Hours, 21 May 1941.

<sup>437</sup> Ibid.

<sup>438</sup> Wesley Frank Craven *et al.*, *The Army Air Forces in World War II* (Washington DC: Office of Air Force History, 1948), 575.

possessed the luxury of time to get through to them, were not afforded the chance.”<sup>439</sup> One cadet undergoing training for the Women AirForce Service Pilots (WASP) program lamented, as late as 1944, that her class was being rushed through instrument training in four weeks rather than the standard five.<sup>440</sup> The WASPs were established in August 1943 when the Army Air Force combined the Women’s Auxiliary Ferrying Squadron (WAFS) and the Women’s Flying Training Detachment (WFTD) into the new command.

Another issue was the balance between making the cadets not only pilots but also Army officers. According to Craven and Cate in the official history of the Army Air Forces (AAF) in World War Two, the civilian-operated primary schools were not prepared to develop “rigid discipline,” and there was not time for military training during more advanced stages of flight training.<sup>441</sup> In another instance, in late 1942, the commander of one preflight training center recommended that the schools reduce the emphasis on classroom instruction in favor of more military training. He was concerned about the “fighting spirit” of the cadets and suggested that bayonet training might be warranted to instill the spirit that they would need for combat.<sup>442</sup> His suggestion did not bear fruit. Nevertheless, the level and intensity of physical training increased through all phases of training.<sup>443</sup> As one instructor noted about physical training, “We could do

---

<sup>439</sup> J. Todd Moye, *Freedom Flyers: The Tuskegee Airmen of World War II*, (New York, NY: Oxford University Press, 2012), 67.

<sup>440</sup> Mickey McLernon Brown, *Women’s Airforce Service Pilots Letters 1943-1944*, (The Woman’s Collection, Texas Woman’s University, Denton TX, 2003). Over 25,000 women applied for flight training, only 1900 were accepted and of those only 1074 went on to flying assignments. Thirty-seven WASPs died in accidents and thirty-six were injured before the program was terminated in 1944. Bernard C. Nalty *et al.*, *With Courage: The U.S. Army Air Forces in World War II* (Washington DC: Air Force History & Museums Program, 1994), 166.

<sup>441</sup> Craven *et al.*, *The Army Air Forces in World War II*, 575.

<sup>442</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944* (Maxwell AFB AL: United States Army Air Forces Historical Division, [November 1946]), 13.

<sup>443</sup> Craven *et al.*, *The Army Air Forces in World War II*, 575.

most anything with the cadets as long as we didn't kill them and it's a wonder we didn't kill some in the beginning."<sup>444</sup> On the other hand, others believed that classroom instruction on flying related subjects should be expanded in order to produce a better pilot. In the crucible of combat, it quickly became apparent that skill as a pilot trumped military bearing; and classroom subjects such as sending and receiving code and navigation were expanded.<sup>445</sup>

Nonetheless, there were problems to be worked out before the Air Corps could meet the goals of the expansion program. The two biggest hurdles the Air Corps faced were, first, finding enough qualified instructors and, second, finding enough airfields for training. The solution to the first problem was addressed by the Air Corps; the second was solved by the Civilian Pilot Training Program (CPTP).<sup>446</sup>

As a New Deal program, the CPTP was presented by the Roosevelt administration to Congress not only as a means to stimulate the light aircraft industry; it would also benefit the Army and Navy by providing a group of partially trained pilots in the event of mobilization.<sup>447</sup> The director of the CPTP acknowledged that the purpose of the program was "To encourage and develop civil aeronautics in accord with the powers bestowed on the Civil Aeronautics

---

<sup>444</sup> Captain Lex W. Fulbright quoted in United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944* (Maxwell AFB AL: United States Army Air Forces Historical Division, 1946), 24-25.

<sup>445</sup> *Ibid.*, 14.

<sup>446</sup> It should be noted that the US Navy's flight training program was similar to the Army Air Forces'. Both used the CPTP program and both had the same phases of training, pre-flight, primary, basic, and advanced. The phases were of roughly the same length of time, the primary difference being scale. The Army Air Forces produced three times the number of naval aviators, 193,000 to 61,000. In addition, the Navy also added a carrier landing phase for those pilots assigned to fly off carriers. Nonetheless, the experiences of cadets, regardless of service, were much same when it came to learning to fly and adjusting to military life.

<sup>447</sup> Dominick Pisano, *To Fill the Skies with Pilots: The Civilian Pilot Training Program, 1939-46* (Urbana IL: University of Illinois Press, 1993), 9-10.



Administration (CAA) by the Civil Aeronautics Act of 1938, and to select and train, in a preliminary way, civilian pilots who would be quickly available for national defense in an emergency.”<sup>448</sup> The program consisted of 45 hours of ground instruction on regulations, navigation, and meteorology.<sup>449</sup> In addition, each student received 50 hours of flight training in a light civilian general aviation aircraft, such as the Piper Cub.<sup>450</sup> After the CPTP schools took over responsibly for primary flight training, they would use the same aircraft as the Army and Navy. However, the Army and Navy were not necessarily comfortable with turning their training over to civilians. When it came to flight training, Arnold cautioned: “There is no economy in employing poorly trained pilots....”<sup>451</sup> For its part, the Air Corps insisted that, at a minimum, the CPTP applicants pass the same physical exam as the regular Air Corps cadets. The CPTP schools themselves were under constant scrutiny from the Air Corps. In any week, a school could be visited by inspectors from four different sections of the Air Corps staff and occasionally would see representatives from all four in the same week.<sup>452</sup> While the Air Corps and the Navy were apprehensive about the program, the vast majority of Americans supported it; for example, a 1939 Gallup Poll indicated that 87 percent of respondents approved of the program.<sup>453</sup> The graduates, while appreciative of the opportunity to learn to fly, took a pragmatic approach to the ultimate benefit of the program. For instance, one graduate of the Tuskegee program noted that

---

<sup>448</sup> Ibid., 36.

<sup>449</sup> Barry M. Stentiford, *Tuskegee Airmen* (Santa Barbara, CA: Greenwood, 2012), 19.

<sup>450</sup> Ibid., 19.

<sup>451</sup> Arnold and Eaker, *This Flying Game*, 102

<sup>452</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 46.

<sup>453</sup> Pisano, *To Fill the Skies with Pilots: The Civilian Pilot Training Program, 1939-46*, 33.

being a graduate of the CPTP did not make one an Army pilot; it only meant the new pilot could fly light planes.<sup>454</sup>

On 12 December 1941, the CPTP was renamed the War Time Service (WTS) to reflect its new wartime function.<sup>455</sup> However, in June 1944, with more than enough pilots in training and a backlog of those awaiting training, the Army Air Force closed the WTS program. Nonetheless, during its five years of existence, the CPTP must be considered an overwhelming success.<sup>456</sup> Even though he had not been an enthusiastic supporter of the program, Arnold paid tribute to the contribution of these primary flight schools to the war effort in his annual report to the Secretary of the Army in 1944. General Arnold concluded: “we could not possibly have trained so many airmen so quickly without these schools.”<sup>457</sup> He credited the men trained in the WTS as a “valuable pool of personnel.”<sup>458</sup> On the other hand, many in the Army Air Force, including Arnold, believed that, although the program was useful when the requirement was to produce pilots, it was not very good at producing a “well-rounded professional officer.”<sup>459</sup>

---

<sup>454</sup> Stentiford, *Tuskegee Airmen*, 223, 30. The first CPTP class at Tuskegee began in January 1940 with eighteen men and two women. This was another program Arnold did not want. Arnold opposed allowing black pilots in the Air Force because pilots were officers and placing black officers over white enlisted men would create an “impossible social problem.” Memorandum from, Chief of the Air Corps for G3, May 1940, quoted in Morris J. MacGregor, *Integration of the Armed Forces, 1940-1965* (Washington DC: Center of Military History, U.S. Army), 647..

<sup>455</sup> Pisano, *To Fill the Skies with Pilots: The Civilian Pilot Training Program, 1939-46*, 84.

<sup>456</sup> Patricia Strickland, *The Putt-Putt Air Force: The Story of the Civilian Pilot Training Program and the Wartime Training Service (1939-1944)*, Vol. GA-20-84 (Washington DC: Federal Aviation Administration, 1971), 115., iii. The program began in 1939 with thirteen schools and 330 students; by 1944, at its height, the WTS was operating 1,132 schools with 1,460 instructors and by the time of its closing the program had produced 435,165 graduates

<sup>457</sup> United States Army Air Forces and Henry Harley Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War* (Washington DC: US GPO, 1944), 316.

<sup>458</sup> *Ibid.*, 316.

<sup>459</sup> Barry H. Nickle, *Contract Flying Training in Air Training Command, 1939-1980* (Maxwell AFB AL: History and Research Division, Air Training Command, 1981), 11.

Another major obstacle facing the Air Corps was finding enough qualified instructors who, even if they could not produce a “well-rounded professional officer,” could at least produce a competent pilot. The mass production of pilots was a problem to which the Air Corps had given little thought before the war. Prior to the expansion program, the attitude among the pilots and senior leaders of the Army Air Force was that teaching did not require any special skills or knowledge and every qualified pilot was considered a qualified instructor.<sup>460</sup> Even so, those training to be instructors were given some specialized instruction of their own. However, this was usually an informal course taught by the more senior instructors who happened to be at the local fields.<sup>461</sup> In addition, according to the official history, much of the burden for mastering subjects in ground school fell to the students, “however imperfect the presentation might be.”<sup>462</sup> This method was viable in the small peacetime Air Corps when the squadron could bring a pilot along at his own pace. But it would not work to train the number of pilots required for the war effort.

At the beginning of the expansion program in 1939, the Air Corps followed a policy of holding over some of the best new graduates of the advanced phase to be instructors in basic flight training.<sup>463</sup> By 1940, the Air Corps developed a four-week, 140-hour instructor course.<sup>464</sup> One instructor assigned to Randolph Field noted: “As we expanded, of course, we began to take in graduates of the flying school, and we brought them right back as instructors. They were students one day, and the next day they were instructors. We gave them a ‘souped-up’

---

<sup>460</sup> Craven *et al.*, *The Army Air Forces in World War II*, 508-509.

<sup>461</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 256.

<sup>462</sup> Craven *et al.*, *The Army Air Forces in World War II*, 509.

<sup>463</sup> *Ibid.*, 487.

<sup>464</sup> *History of Kelly Field* (Kelly Field TX, 1945), 210.

instructors' course at Randolph."<sup>465</sup> However, the official history noted that the results were mixed because not every pilot assigned to instructor duty, no matter how good a pilot he might have been, was well qualified to be an instructor.<sup>466</sup> In some cases, the power went to their heads. For instance, one of the first holdovers, George Spencer Roberts, was placed in charge of the following class and introduced himself as, "Aviation Cadet George Spencer Roberts, My friends call me 'Spanky.' To you I'm 'Mister Roberts.' To me you are 'Dummies.'"<sup>467</sup>

In other cases, the instructor was overqualified. More than a few of the contract instructors, at the CPTP airfields, had been flying since the early days of aviation and had been instructors long before the Air Corps hired them. Now the instructors were asked not only to teach a man to fly, but they also had to impart precision to the cadet, something many had never considered necessary.<sup>468</sup> One future instructor, C. V. Glines, recalled an incident during his "check-ride" before being certified as an instructor. He asked his check-ride pilot about two gauges they had never used, and the check-ride pilot cautioned Glines not to use them because they were for "airline pilots."<sup>469</sup> The gauges in question were necessary for flying at night and in inclement weather, skills the Air Corps would find essential during the war.

The air staff was coming to see that instructing and teaching were specialized tasks that required specialized skills. According to the official history, "the AAF discovered that it was, of necessity, in the teacher-training business as well, since many of those who had been recruited as

---

<sup>465</sup> History of Central Flying Command, quoted in Craven *et al.*, *The Army Air Forces in World War II*, 487.

<sup>466</sup> *Ibid.*, 487.

<sup>467</sup> Charles W. Dryden, *A-Train: Memoirs of a Tuskegee Airman* (Tuscaloosa AL: University of Alabama Press, 1997), 36.

<sup>468</sup> Willard Wiener, *Two Hundred Thousand Flyers, the Story of the Civilian AAF Pilot Training Program* (Washington DC: The Infantry Journal, 1945), 13.

<sup>469</sup> C. V. Glines, "Duckworth's Legacy," *Air Force Magazine* 73, No. 5 (May 1990): 178-179.

instructors had to be ‘retooled’ to qualify for teaching the Air Corps curriculum.”<sup>470</sup> To address this problem the Air Corps established a school for these contract instructors at Randolph Field to teach the Air Corps method of instruction.<sup>471</sup> One instructor credited the establishment of a centralized instructor school at Randolph for reducing accidents in twin-engine flight training by standardizing instruction procedures.<sup>472</sup> By the end of the war, the Army Air Force was able to procure enough planes and instructors to create a training program that they could take to the training airfields to not only check on the instructors but also to demonstrate how to teach.<sup>473</sup>

Many of the squadron and group commanders, along with many of the pilots, never considered ground school important. It was the part of training that was most likely to be cut when there was a need to reduce hours in the program of instruction. In fact, a plan was proposed to graduate students from primary to basic on a proficiency basis. In other words, a cadet would advance as soon as he demonstrated proficiency in key tasks, rather than waiting until he had completed the curriculum. The Air Staff recommended to Arnold that the plan not be adopted because “all students should be required to complete the entire ground school course of the elementary schools.”<sup>474</sup> Arnold concurred and cadets continued to graduate as a class. Despite the need perceived by Arnold and the Air Staff for all cadets to complete the ground school course, there was very little standardization in the curriculum, for each phase, from one school to the next, and, in many cases, there was much duplication between phases.<sup>475</sup> The official history

---

<sup>470</sup> Craven *et al.*, *The Army Air Forces in World War II*, 487.

<sup>471</sup> *Ibid.*, 458.

<sup>472</sup> Major General David V. Miller, interview by James C. Hasdorff, (United States Air Force Oral History Program, 20 September 1985), 10.

<sup>473</sup> *Ibid.*, 458.

<sup>474</sup> Memorandum to Chief of Staff Army Air Corps, 28 August 1941.

<sup>475</sup> *Ibid.*, 574.

noted that, over the course of the war, these two problems would be corrected when “a satisfactory integration was achieved by 1944 through more careful planning of the curriculum and frequent conferences between the teaching staffs of the air and ground departments.”<sup>476</sup>

During ground school, the cadet learned the “why” and “how” of flight.<sup>477</sup> For one Embry-Riddle contract instructor, ground school went from a “necessary evil,” in his opinion, to an important aspect of training.<sup>478</sup> It was in ground school that the cadet learned the inner workings and mechanics of his particular aircraft as well as the theory and principles of flight. For example, in primary there were 96 hours devoted to “aero-equipment, navigation, and principles of flight.”<sup>479</sup> The aero-equipment course was devoted to the workings of the operating systems of aircraft in general and the cadet’s aircraft in particular. One the most critical courses was the navigation course, which emphasized cross-country flight planning for long-distance flights.<sup>480</sup> Principles of flight covered applied physics with special attention to the aspect of the behavior of airplanes in flight.<sup>481</sup> Most cadets mastered the ground school subjects without much trouble, but there was near unanimous agreement among all of the cadets that the most difficult part of ground school was learning Morse code.<sup>482</sup> For their part, the instructors began to notice a correlation between academic performance in ground school and flying ability. As one Embry-

---

<sup>476</sup> Ibid., 574.

<sup>477</sup> Stephen G. Craft, *Embry-Riddle at War: Aviation Training during World War II* (Gainesville: University Press of Florida, 2009), 176.

<sup>478</sup> Ibid., 176.

<sup>479</sup> Craven *et al.*, *The Army Air Forces in World War II*, 574.

<sup>480</sup> Ibid., 574.

<sup>481</sup> Ibid., 574.

<sup>482</sup> This was a common complaint among cadets regardless of the program. For example, one WASP candidate mentioned that learning Morse Code was the most difficult part of her training in a letter home. Mickey McLernon Brown, *Letters 1943-1944*, (The Woman’s Collection, Texas Woman’s University, Denton TX, 2003).

Riddle instructor noted, “one who made poor grades usually did not last long on the flight line, his flying reflecting his academic record.”<sup>483</sup> On the other hand, a postwar study noted that cadets were “seldom eliminated for ground school deficiencies.”<sup>484</sup> The study went on to place some of the blame on the United States’ education system’s emphasis on the “practical” over the intellectual; the author of the study did not elaborate on what was meant by the difference between “practical” and “intellectual.”<sup>485</sup>

The leaders of the Army Air Force realized that not only were they going to need more flight instructors, but also more ground school instructors. The Air Staff determined that these ground school courses did not require a rated pilot and turned to professional teachers to make up the needed instructors. While the Army Air Force did attract a large number of instructors with experience teaching in colleges or universities, the vast majority of them were high school teachers.<sup>486</sup> The official history notes that the instructors were given a two-week course on drill and customs and courtesies and then left alone to develop the lessons for their particular ground school subject.<sup>487</sup> In addition, unlike military instructors, they were given no additional duties, and so they could focus on teaching and grading.<sup>488</sup>

---

<sup>483</sup> Craft, *Embry-Riddle at War: Aviation Training during World War II*, 66.

<sup>484</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952*, 4.

<sup>485</sup> *Ibid.*, 4.

<sup>486</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944*, 39.

<sup>487</sup> *Ibid.*, 31.

<sup>488</sup> *Ibid.*, 31.

Professor Alfred Lindesmith, a sociology professor at Indiana University, was recruited to be a ground school instructor at the Aviation Cadet Center in San Antonio.<sup>489</sup> He recalled being at a faculty meeting in late 1942 where it was announced that the Army Air Forces was in need of experienced teachers for its ground school subjects.<sup>490</sup> At the meeting, Army Air Forces recruiters put on a hard sell. Lindesmith noted: "The recruiting officers conveyed the impression that there was a pressing need for persons with academic background, that they would receive the usual rewards and recognition, and certainly that they would not be discriminated against."<sup>491</sup> Lindesmith bitterly recalled that none of these came to pass.<sup>492</sup> On the other hand, Lindesmith and his colleagues were the victims of a recurring problem that the Army Air Forces recruiters faced wherever they went. The recruiters were in competition with the Navy for the same instructors and the recruiters felt pressured to undercut the Navy. As an Army Air Forces official history noted: "Undoubtedly, the men who did the field work, faced with vigorous competition [from the Navy], were tempted to make their own proposition somewhat more attractive than the facts warranted, particularly in regard to assurances concerning rank and promotions, not to mention assignments."<sup>493</sup>

---

<sup>489</sup> Alfred R. Lindesmith, "Teachers in the Army Air Forces," *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar 1946), 404.

<sup>490</sup> Ibid., 404. These recruiters were typically formed into boards and assigned different sections of the United States. They would visit the colleges and universities in their area making a sales pitch for instructors. The academic discipline of the instructor was irrelevant, the Army just needed teachers. United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944*. Maxwell AFB AL: United States Army Air Forces Historical Division, November 1946.

<sup>491</sup> Alfred R. Lindesmith, "Teachers in the Army Air Forces," *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar 1946), 404.

<sup>492</sup> Ibid., 405.

<sup>493</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944* (Maxwell AFB AL: United States Army Air Forces Historical Division, November 1946), 36.



Nonetheless, Professor Lindesmith, and many others, answered the call. However, in many ways these instructors endured the same culture clash as the experienced flight instructors as they tried to adapt their teaching skills to a more rigid style of instruction.<sup>494</sup> For example, at one school, instructors were evaluated on “voice, apportionment of time, speed, force, clarity and knowledge, discipline and interest, “all things that could be checked by an inspector during a classroom visit.”<sup>495</sup> Lindesmith, in particular, seemed to be quite bitter over his treatment by the Army. He stated that a ground school instructor was assessed not so much on his teaching but on his ability as a “drill instructor.”<sup>496</sup> Moreover, he recalled a general lack of respect if not outright contempt for himself and his peers.<sup>497</sup> Even the official history noted the growing discontent among the instructors, especially among the later hires whose qualifications, in many cases, were superior to those of the persons for whom they were working.<sup>498</sup>

The cadets themselves endured the training and indoctrination process in order to win their wings. Eugene Fletcher took flight training through the Martin School of Flying as part of the CPTP at Whitman College in Washington State.<sup>499</sup> While not happy about the harassment he received from his tactical officer, who was an active duty officer, he suggested that it allowed everyone to assess the “mettle of their peers.”<sup>500</sup> Another cadet, Gordon Bennett Robertson, had

---

<sup>494</sup> Ibid., 406.

<sup>495</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944*, 46.

<sup>496</sup> Lindesmith, *Teachers in the Army Air Forces*, 406.

<sup>497</sup> Ibid., 406.

<sup>498</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944*, 31.

<sup>499</sup> Eugene Fletcher, *Mister: The Training of an Aviation Cadet in World War II* (Seattle WA: University of Washington Press, 1992), 11.

<sup>500</sup> Ibid., 29.

a similar opinion about the purpose of the harassment. He commented that the instructors were hard on the cadets, but it was accepted by the cadets because they understood that the Air Corps had to eliminate those who could not take the pressure “physically or psychologically.”<sup>501</sup> For his part, Fletcher used the harassment to strengthen his resolve to finish the course, thinking to himself, “Degrade me all you want, I might be thrown out or wash out but I will never resign.”<sup>502</sup> On the other hand, Fletcher was enamored of the idea of flying. He admitted, after the war, that he had not given much thought to the fact that his job was going to be killing, not until Eddie Rickenbacker gave a speech to his class. Rickenbacker admitted to Fletcher’s class that he envied them and encouraged them “to kill, to have no pity.”<sup>503</sup>

Those who were already involved in killing without pity were not always pleased with the pilots produced by the flight schools. Some were concerned with the level of training the cadets were receiving and others wanted the training to be theater-specific. However, the Air Corps considered the latter impractical given the global nature of the war.<sup>504</sup> During the early years of the war, the perception of many commanders, such as Colonels Leon Johnson and Curtis LeMay, was that the groups and squadrons were getting un-trained or at best undertrained pilots and crews.<sup>505</sup> Retired General David Burchinal commented on the “90 day wonders” as he called them. In Burchinal’s opinion, these “90 day wonders” went through the three phases of training,

---

<sup>501</sup> Gordon Bennett Robertson, *Bringing the Thunder: The Missions of a World War II B-29 Pilot in the Pacific*, 1st ed. (Mechanicsburg PA: Stackpole Books, 2006), 34.

<sup>502</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 29.

<sup>503</sup> *Ibid.*, 31-32.

<sup>504</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952*, 4.

<sup>505</sup> Curtis E. LeMay *et al.*, *Strategic Air Warfare: An Interview with Generals Curtis E. LeMay, Leon W. Johnson, David A. Burchinal, and Jack J. Catton* (Washington DC: Office of Air Force History, U.S. Air Force, 1988), 26.

earned their wings, and then it was “on your way.”<sup>506</sup> As he recalled, ideally, it took 3000 hours flying time before a pilot qualified as a B-17 command pilot.<sup>507</sup> LeMay claimed that he received pilots right from single-engine training with no multi-engine experience.<sup>508</sup> LeMay was probably referring to an occurrence very early in the war when there was shortage of twin-engine aircraft and a group of pilots was graduated from advanced twin-engine training having flown only single-engine aircraft.<sup>509</sup> In addition, other reports from the field indicated that the groups and squadrons considered that “it was more economical to suffer a few more accidents, including fatal ones, and lose a few more aircraft in the United States” than in theater.<sup>510</sup> While this may have been the opinion from the field, the training base never lost sight of the fact that it had to balance the needs of the force with the safety and training of the pilots. Beginning with preflight, this balance was always foremost in every phase of training.

In order to better acculturate the new cadets and to compensate for the lower educational requirement for admission into the Air Corps, a preflight phase of training was added. During preflight, the cadet learned both about both the Army and about being an officer. Guidance from the office of the Chief of the Air Corps directed that this phase of training would consist of "physical training, military training, supervised athletics and the complete processing of assigned students," as well as "additional instruction and training as may be practicable . . . to further

---

<sup>506</sup> Ibid., 26

<sup>507</sup> Ibid., 26.

<sup>508</sup> Ibid., 26-27.

<sup>509</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952*, 3.

<sup>510</sup> Ibid., 293.

qualify trainees for instruction as pilots, bombardiers, or navigators.”<sup>511</sup> The purpose of the four-week course was to provide basic military indoctrination and to prepare the student for flight training.<sup>512</sup> Fletcher recalled that a typical pre-flight day “consisted of two hours of classes, two hours of calisthenics or athletics, four hours of marching, and three hours off for breakfast, lunch, and dinner.”<sup>513</sup> He added that it was here that he learned basic military training, such as the manual of arms, physical training, and guard duty.<sup>514</sup>

A sample training schedule from 1940, for a four-week course, consisted of the following subjects:

Subjects	Hours
Military courtesy	6
Articles of War	4
Personal hygiene and first aid	12
Wearing of uniform	8
Alpha and mathematics test	2
School of the Soldier	127
Interior guard duty	6
Government insurance	3
Miscellaneous	24
TOTAL	192

---

<sup>511</sup> Letter Office, Chief of Air Corps to Commanding Officer Southeast Training Command, 1 and 2 October 1940 quoted in *ibid.*

<sup>512</sup> Memorandum on Training Program, Undated, 1.

<sup>513</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 33.

<sup>514</sup> *Ibid.*, 27.

With sixty percent of the time allocated to the “School of the Soldier,” it is apparent that the initial emphasis was on preparing the cadet to be a soldier first.<sup>515</sup> However, unintentionally, preflight became a screening process for those who were not only qualified to be officers and pilots but also had the desire to be both. Eugene Fletcher recalled that four enlisted men requested to be returned to their units because “a commission was not worth all the grind and hassle that they had been subjected to.”<sup>516</sup> He noted that this process was often too much for the married cadets. Fifty percent of Fletcher’s preflight class were married. In his memoir, he described talking to two married cadets who had asked to be dropped. They told him that they would rather be enlisted men with, as they perceived it, regular hours and spend time with their wives. They told Fletcher that “[t]hey were tired of quarantine, tired of making love on paper in the form of letters to their wives, and tired of the constant hazing, putdowns, and the degrading cadet life.”<sup>517</sup> He thought that they were crazy and he recalled that they thought the same of him.<sup>518</sup>

In August 1941, the Chief of the Medical Division recommended that the preflight phase be increased to ten weeks in order to give the medical staff time to examine and treat the new cadets. The chief was politely told no; his staff would have to make do.<sup>519</sup> Nonetheless, the course was lengthened in March 1942 to accommodate more specialized training for pilots and non-pilots or bombardiers and navigators. Non-pilot training placed a “greater emphasis upon mathematics, target identification, photography, and meteorology.”<sup>520</sup> The instructors also

---

<sup>515</sup> The “School of the Soldier” consisted of topics such as drill and ceremonies, basic marksmanship, and history and heritage of the Army.

<sup>516</sup> *Ibid.*, 40.

<sup>517</sup> *Ibid.*, 47.

<sup>518</sup> *Ibid.*, 48.

<sup>519</sup> Memorandum on Training Period in Reception Center for Cadets, 29 August 1941, 1-2.

<sup>520</sup> Craven *et al.*, *The Army Air Forces in World War II*, 558.

discovered that many of the cadets were deficient in basic math and science skills.<sup>521</sup> To make up for this deficiency, the students spent up to five hours a day on these subjects.<sup>522</sup> In addition, over the course of the war, the trend had been to emphasize the technical aspects of flying rather than military training.<sup>523</sup> This emphasis on the technical side reflected supposed lessons from the First World War when the Air Service stressed technical training over military training at its mechanics schools, insisting that its personnel receive only enough military training to “permit them to move in a military manner from place to place.”<sup>524</sup> Moreover, as the Army Air Force gained combat experience, the preflight course became more “practical” and the students spent more time on exercises such as cross-country flight planning.<sup>525</sup> The official history concluded that this was a “logical response to the increasingly technical nature of air combat.”<sup>526</sup>

Although many of the cadets were not thrilled with the ground school part of preflight training (after all, they had joined to fly planes — not go to school), they came to realize that preflight was another opportunity to “wash out.” Some saw it as a way to put cadets in a competitive frame of mind. For example, Eugene Fletcher recalled that there were numerous competitions pertaining to academics, drill, and inspections with the top unit receiving a streamer for their unit flag.<sup>527</sup> Most of those who washed out during preflight were eliminated for academic, physical, or disciplinary deficiencies.<sup>528</sup> During the period 1939–1945, the rate of

---

<sup>521</sup> Ibid., 559.

<sup>522</sup> Ibid., 559.

<sup>523</sup> Flying Training Command Memorandum 21 Apr. 1943 and 19 Feb. 1943 quoted in *ibid.*.

<sup>524</sup> Ibid., 527-28.

<sup>525</sup> Ibid., 529.

<sup>526</sup> Ibid., 558.

<sup>527</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 207, 44-46.

<sup>528</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944*, 54.

elimination varied from 1 to 15 percent depending on the needs of the AAF.<sup>529</sup> Not surprisingly, by early 1944, with a lower demand for pilots, the standards went up for the remainder of the war, and there was a corresponding increase in the washout rate. Charles Watry's experience was typical. He was assigned to Class 44B; classes were numbered by the year and month they would graduate, therefore, Class 44B graduated in February 1944. Watry recalled that 787 of the 4,931 cadets in his class were dropped from the course during preflight training for a failure rate of sixteen percent.<sup>530</sup>

Watry's class was also part of an experiment that reduced preflight to four weeks. Courses such as math, physics, meteorology, and aircraft engines were eliminated, even though previous data had indicated the importance of these subjects. However, the AAF was trying to reduce training time for any reason; and the justification, for Watry's class, was that the cadets had gone through the college training program and therefore could skip these basic courses.<sup>531</sup> This, according to Watry, was fine with him since it reduced the opportunities to wash out.<sup>532</sup> Most of the cadets viewed washing out as the ultimate shame. Despite the competition and drive to succeed, however, some did not view "washing out" as a crushing blow. In fact, some accepted it with a degree of relief. One cadet admitted that he was not a "gung-ho" pilot and had volunteered only for the flight pay. He said after the war: "I figured if I wasn't going to be a good pilot, I didn't want to be out there."<sup>533</sup>

One problem the Air Corps could not always control was the effect of so many men living together in confined quarters. There were persistent outbreaks of various diseases and

---

<sup>529</sup> Ibid., 54.

<sup>530</sup> Charles A. Watry, *Washout!: The Aviation Cadet Story*, 1st ed. (Carlsbad CA: California Aero Press, 1983), 83.

<sup>531</sup> Ibid., 74.

<sup>532</sup> Ibid., 75.

<sup>533</sup> Moye, *Freedom Flyers: The Tuskegee Airmen of World War II*, 68.

ailments. It is interesting that, in their memoirs, both Eugene Fletcher and Charles Watry repeatedly describe being quarantined for maladies such as pinkeye, meningitis, head colds, and the flu. What neither of them addressed was that these “quarantines” happened around the time they were about to graduate or had just arrived at a new base. Perhaps it was the Army’s way of maintaining control of these cadets as they were leaving a base or had just arrived at the next phase in their training. For example, during his initial sixteen weeks in the Army, Fletcher had received only one twelve-hour and two twenty-four hour passes; and on his arrival at primary flight training, his squadron was quarantined for two weeks.<sup>534</sup> Regardless of the purpose of the quarantine, Fletcher’s arrival at primary flight training signaled the beginning of his military flight training.

No one in the Air Corps doubted the importance of the primary phase of flight training. It was the cadet’s introduction to flying and was the most critical step in turning the cadets into military pilots. Arnold likened primary flight training to that of the “ancient guilds [sic]” consisting of an instructor, five students, and an airplane.<sup>535</sup> He added that those who did not demonstrate the “necessary degree of confidence and pilot skill are generally dropped from further instruction.”<sup>536</sup> Arnold stressed that a pilot had to be able to divide his attention among many tasks to be an effective pilot. Otherwise, if he is “mentally inelastic...he is not the flying type and must be eliminated for his own protection.”<sup>537</sup> The commander of Moffett Field was more direct in a memorandum to a member of the air staff. He believed, he said, that primary flight training was where the Air Corps determined if a pilot had the skills and other attributes to

---

<sup>534</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 64.

<sup>535</sup> Arnold and Eaker, *This Flying Game*, 88.

<sup>536</sup> *Ibid.*, 94.

<sup>537</sup> *Ibid.*, 92.



be a competent flyer.<sup>538</sup> More to the point, he stated that primary flight training was “[t]o separate the sheep from the goats....”<sup>539</sup>

Not only was the primary phase the cadet’s introduction to flying, it was also the phase where he was most likely to be “washed out.” Of all the phases of flight training, primary had the highest elimination rate, averaging 27.5 percent.<sup>540</sup> According to a history of the CPTP, “The figures confirmed that getting through primary training posed the biggest hurdle to attaining pilot’s wings. A cadet’s future was most at risk during primary training, when the AAF had the least financial investment and when training was the least dangerous.”<sup>541</sup> It was at times a harsh and unforgiving system. One cadet noted that those who “washed out might have been good pilots had they been given a little extra time, but this was wartime and pilots were needed immediately. Those who learned the quickest would succeed.”<sup>542</sup> Not being privy to the changes the Army Air Forces had made to increase eligibility for training, Eugene Fletcher believed that eliminating students early in the process was driven, in part, by a shortage of instructors and by the Army Air Forces’ effort to lower the number of students to a more manageable level.<sup>543</sup> The standard student-teacher ratio set by the Army Air Force was one instructor for every five cadets and one airplane for every three.<sup>544</sup> Fletcher recalled that, occasionally, a cadet might be held

---

<sup>538</sup> Letter from Brigadier General E. B. Lyon Commander Moffett Field to Brigadier General Davenport Johnson, Assistant Chief of the Air Corps on the propose changes to flying training hours, 23 July 1941.

<sup>539</sup> Ibid.

<sup>540</sup> Strickland, *The Putt-Putt Air Force: The Story of the Civilian Pilot Training Program and the Wartime Training Service (1939-1944)*, 69.

<sup>541</sup> Ibid., 69.

<sup>542</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 85.

<sup>543</sup> Ibid., 65.

<sup>544</sup> Letter from Brigadier General E. B. Lyon Commander Moffett Field to Brigadier General Davenport Johnson, Assistant Chief of the Air Corps on the propose changes to flying training hours, 23 July 1941.

back one class rather than eliminated. He noted that this was usually done in cases when the cadet had been held back for medical reasons.<sup>545</sup>

Primary flight training was strictly under the purview of the contract schools such as Embry-Riddle in Miami, Florida. The instruction at these schools was adapted from the Air Corps curriculum formerly taught at Randolph Field.<sup>546</sup> Although the ground school portion had been reduced to nine weeks, flying hours were only reduced from 65 to 60 in March 1942 and would remain at 60 for the duration of the war.<sup>547</sup> Fletcher recalled that the amount of flight time required to graduate was not an estimate — it was “accurate right to the minute.”<sup>548</sup> On the day he was supposed to graduate from primary flight training, Fletcher’s instructor notified him that he was eleven minutes short of the required 65 hours. The squadron commander told Fletcher to get into his flight gear and meet his instructor on the flight line. Fletcher’s instructor had a plane ready to go. Fletcher took off flew around the field for eleven minutes, landed, changed back into his dress uniform and went to graduation.<sup>549</sup>

Most of the cadets were glad to have preflight behind them. Fletcher wrote to his wife that primary flight school was a step up from preflight. The cadets lived in three-person cottages rather than barracks, slept on real beds, and were exempt from mundane duties such as “kitchen police” (KP) and guard duty.<sup>550</sup> Apparently, these comforts and exemptions from additional duties depended on the airfield to which one was assigned. A cadet assigned to a different field

---

<sup>545</sup> Eugene Fletcher, *Mister: The Training of an Aviation Cadet in World War II* (Seattle WA: University of Washington Press, 1992), 85.

<sup>546</sup> Craven *et al.*, *The Army Air Forces in World War II*, 569.

<sup>547</sup> *Ibid.*, 569.

<sup>548</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 73.

<sup>549</sup> *Ibid.*, 106.

<sup>550</sup> *Ibid.*, 64.

was not as impressed as Fletcher was with the level of comfort or amenities at his flight school.<sup>551</sup> Fletcher described a typical duty day as running from 0600 until 1930 and as being full of flying, classes, physical training, and drill.<sup>552</sup> The welcome speech Fletcher and his classmates received was from a World War One veteran and accomplished Air Corps pilot. Fletcher recalled the speech left him feeling “a sense of pride in ourselves and a feeling we could control our destiny.”<sup>553</sup> However, that destiny was also going to be in the hands of their instructors and the senior cadet cadre.

Upon arriving at primary flight training school, Fletcher and his classmates were marched around the parade field by the senior cadet cadre. Before being shown to their quarters, the new arrivals were directed by the senior cadets to remove their aviation cadet brass. They were told they would get it back after they soloed; until then, the senior cadet cadre would refer to them as “dodos.”<sup>554</sup> The mark of a “dodo” or a cadet not flight-qualified varied from station to station. At one station, it might be wearing the flight helmet with flaps down; at another, it might be wearing goggles around the neck rather than on top of the flight helmet.<sup>555</sup> Regardless of the manner, the meaning was the same: to insure that the cadet knew his place in the squadron. In an odd twist, rather than assign the men to squadrons alphabetically, Fletcher noted that the cadets were assigned to squadrons by height.<sup>556</sup> He never asked why and no one bothered to tell him.

The cadets were next introduced to the most important man in their lives for the next nine weeks: their instructor. One cadet, Phillip Ardery, who went on to be a bomber pilot, described

---

<sup>551</sup> Philip Ardery, *Bomber Pilot: A Memoir of World War II* (Lexington KY: University Press of Kentucky, 1978), 8.

<sup>552</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 207.

<sup>553</sup> *Ibid.*, 66.

<sup>554</sup> *Ibid.*, 62.

<sup>555</sup> Watry, *Washout!: The Aviation Cadet Story*, 191, 87.

<sup>556</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 63.

his instructor as an “old-time barnstormer.”<sup>557</sup> Fletcher’s instructor was a former Navy pilot as was his squadron commander.<sup>558</sup> According to Fletcher, “The instructors’ job was not an easy one and I’m sure they questioned their own sanity for applying for the job on more than one occasion.”<sup>559</sup> The instructors themselves understood the risks. They understood that, at times, they might have pushed their students harder than they should have. As one of the early instructors recalled after the war:

There were a lot of accidents. A lot people were killed. A lot of my instructor friends were killed and of course many students. Especially right after the war started in December 1941. We started really flying intensely. Sometimes I think probably without sufficient supervision. Letting the students get out at night when the weather wasn’t too good. They would come back to Kelly Field with a 200-foot ceiling. They couldn’t hack it. They weren’t capable of coming into a 200-foot ceiling. We instructors didn’t have any problem. We could come in there and get under the scud, which we’d done many times.<sup>560</sup>

Once combat crews began completing their tours of duty, they returned to the United States to become instructors where they could pass on their experience. However, the use of returning combat veterans as instructors brought its own set of challenges. As the official history noted, “Many of the returnees were lacking in background and maturity.”<sup>561</sup> For example, one instructor recalled betting a fellow instructor a round of Cokes that his pilots could stop shorter on landing.

---

<sup>557</sup> Ardery, *Bomber Pilot: A Memoir of World War II*, 9.

<sup>558</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 207.

<sup>559</sup> *Ibid.*, 68.

<sup>560</sup> Miller Interview, 20.

<sup>561</sup> United States Army Air Forces, *Army Air Forces Historical Study no 61: Combat Crew and Unit Training in AAF, 1939-1945* (Maxwell AFB AL: Air Historical Office, Department of the Air Force, 1949), 65.

The other instructor, in exhorting his cadets over the radio, rattled one of them so badly that the cadet raised his landing gear upon touching down.<sup>562</sup>

The official history also observed that many of the returning aircrew missed the excitement of combat and “found it difficult to acquire the painstaking and sympathetic attitude necessary for good instruction.”<sup>563</sup> In one instance, a veteran B-24 pilot was reassigned to a gunnery school. After getting bored with flying circuits for the gunners, he decided to see if he could fly his B-24 with all four engines feathered. The resulting crash killed the pilot and several of the gunnery cadets.<sup>564</sup> The Army Air Force eventually established a program to insure that only those best suited to be instructors were accepted; the rest were returned to combat.<sup>565</sup> Not surprisingly, by March 1945, 90 percent of instructors were combat veterans.<sup>566</sup>

The Army Air Force, in an effort to help the instructor and to standardize grading and performance requirements finally published, for the first time in December 1943, an instructor’s manual for primary flight training. The semi-annual report for the Office of Flying Safety referred to the publication of this manual as “one of the most valuable projects ever undertaken” by that office.<sup>567</sup> The introduction to the 1944 edition stated in bold print that the manual was an “ILLUSTRATED CHECK LIST FOR FLYING INSTRUCTORS.”<sup>568</sup> The introduction closed

---

<sup>562</sup> Miller Interview, 15

<sup>563</sup> United States Army Air Forces, *Army Air Forces Historical Study no 61: Combat Crew and Unit Training in AAF, 1939-1945* (Maxwell AFB AL: Air Historical Office, Department of the Air Force, 1949), 65.

<sup>564</sup> Anthony J. Mireles, *Fatal Army Air Forces Aviation Accidents in the United States, 1941-1945* (Jefferson NC: McFarland, 2006).

<sup>565</sup> United States Army Air Forces, *Army Air Forces Historical Study no 61: Combat Crew and Unit Training in AAF, 1939-1945*, 65.

<sup>566</sup> *Ibid.*, 65.

<sup>567</sup> History of the Army Air Forces Office of Flying Safety for December 1943, 57.

<sup>568</sup> United States Army Air Forces. Training Command, *Primary Flying: Instructors Manual*, 7.

with the guidance that the instructors should, “Above all, make sure that they [the students] learn how to fly an airplane, with confidence and consistent proficiency.”<sup>569</sup> The manual emphasized that the instructor should not strive for perfection in maneuvers but “good, solid, basic flying techniques.”<sup>570</sup> The cadets were graded in four categories: judgment, attitude, progress, and technique and given a letter grade of A through F.<sup>571</sup> However, instructors were cautioned not to give “F’s” lightly. They should “be sure that, as far as you are concerned, the student is a dangerous risk. He will not make a military pilot.”<sup>572</sup> To give every cadet a fair chance, there were military pilots assigned to every contract field to perform check rides and insure standardization in training by the civilian instructors. They gave check rides to students who were having problems; riding in the backseat, they would decide if the student had the potential to continue with the program or should be washed out.<sup>573</sup> On the other hand, Royal Air Force (RAF) officials criticized the Army Air Forces’ training methods. They believed they were too rigid with too much emphasis on precision and not enough on forced landings, aerobatics, cross-country flying, and map reading.<sup>574</sup> However, they did concede that the speed and scope of the program pushed the capabilities of the instructors, not to mention the wear and tear on the aircraft.<sup>575</sup>

The Army Air Forces issued a companion manual for the cadets so they would understand the standard that would be used to judge their performance. The student’s primary

---

<sup>569</sup> Ibid., 7.

<sup>570</sup> Ibid., 7.

<sup>571</sup> Ibid., 108.

<sup>572</sup> Ibid., 109.

<sup>573</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 85.

<sup>574</sup> Craft, *Embry-Riddle at War: Aviation Training during World War II*, 80-81.

<sup>575</sup> Strickland, *The Putt-Putt Air Force: The Story of the Civilian Pilot Training Program and the Wartime Training Service (1939-1944)*, 69.

flight manual was full of safety tips and pointers on what the instructor would be looking for in each maneuver.<sup>576</sup> In addition, the instructor's manual had the same list of pointers the instructor should look for in the cadet.<sup>577</sup> Charles Watry recalled that his flight training was divided into four phases — pre-solo, precision maneuvers, accuracy, and acrobatic — with his instructor observing, coaching and mentoring along the way.<sup>578</sup> Fletcher recounted how his instructor would yell and jerk the controls every time he set up for a landing making his life so miserable that he began to doubt himself.<sup>579</sup> His instructor eventually explained to him that the harassment was only meant to test him in stressful situations.<sup>580</sup> Another instructor required his students to place their hands on their heads when he was demonstrating various maneuvers so that their hands would not “freeze” on the control column in case they panicked.<sup>581</sup> One Tuskegee cadet recalled that he “damn near killed [his] instructor” because he, the cadet, was doing everything by “rote” and he did not have a “feel” for the plane.<sup>582</sup> Nonetheless, Fletcher later recalled watching a particularly suspenseful solo attempt by a fellow cadet. After the cadet successfully landed, Fletcher saw the cadet's “misty-eyed instructor” climb up to the cockpit to congratulate the cadet.<sup>583</sup> He thought at the time “that the instructors cared more for the welfare of the students than they were willing to admit.”<sup>584</sup>

---

<sup>576</sup> United States Army Air Forces. Training Command, *Primary Flying; Students' Manual* (Fort Worth TX., 1944), 123.

<sup>577</sup> United States Army Air Forces. Training Command, *Primary Flying; Instructors Manual*, 111.

<sup>578</sup> Watry, *Washout!: The Aviation Cadet Story*, 93-94.

<sup>579</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 11.

<sup>580</sup> *Ibid.*, 12.

<sup>581</sup> Marvin L. Skelton, *Memoirs of a World War II Pilot* (Manhattan KS: Military Affairs/Aerospace Historian, 1978), 58.

<sup>582</sup> Moye, *Freedom Flyers: The Tuskegee Airmen of World War II*, 61.

<sup>583</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 87.

<sup>584</sup> *Ibid.*, 87.

Despite how much concern the instructor may have had, mistakes were going to happen. For small infractions, Fletcher recalled, students had to wear a red armband to signify “that he was an accident ready to happen, so beware.”<sup>585</sup> For a major infraction, the cadet was forced to wear a cowbell around his neck.<sup>586</sup> He noted that, in time, these became badges of honor and were worn with a somewhat “false” pride.<sup>587</sup> However, he was also quick to point out that he never wore the armband or cowbell because, if a cadet earned enough of these questionable “badges of honor,” he would eventually be washed out.<sup>588</sup>

Charles Watry noted there was a 16 percent washout rate in his primary class.<sup>589</sup> This was comparable to Fletcher’s experience of losing 12 percent of his class.<sup>590</sup> Watry identified two groups that appeared to have a higher washout rate: those with civilian flying experience; and student officers.<sup>591</sup> The former, he believed, could not adjust to flying the “Army way” while the latter did not appear to apply themselves to the task.<sup>592</sup> Perhaps because of the different expectations in flight training, as noted previously, nearly half of the first RAF class at Embury-Riddle washed out. The schools themselves had no fixed policy and no quota; they could graduate as many or as few they wanted as long as the graduates were, in the opinion of the flight instructors, “the best.”<sup>593</sup>

---

<sup>585</sup> Ibid., 86.

<sup>586</sup> Ibid., 86.

<sup>587</sup> Ibid., 86.

<sup>588</sup> Ibid., 86.

<sup>589</sup> Watry, *Washout!: The Aviation Cadet Story*, 92.

<sup>590</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 108.

<sup>591</sup> Watry, *Washout!: The Aviation Cadet Story*, 92.

<sup>592</sup> Ibid., 92.

<sup>593</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 45.



The accident rate in preliminary flight training was about average for the entire training command at 50 per 100,000 flight hours.<sup>594</sup> However, the rate for fatal accidents was below the average at two per 100,000 flight hours.<sup>595</sup> A postwar study noted that the most dangerous times in primary training were the first ten to fifteen hours and the last fifteen hours.<sup>596</sup> The former was the time when the cadet was just learning the aircraft, and the latter was when the cadet was not only flying solo more often but was also feeling more confident in his abilities. Instructors were advised to keep their hands on the controls and to insure that students understood the procedures for landing and recovery from “unintentional” spins before allowing them to solo.<sup>597</sup> In an effort to keep down the accident rate and to track cadets with potential problems, the names of those students who had only met the minimum standards to pass primary flight training and might have trouble making it through basic were passed on to the basic school instructors.<sup>598</sup> Those who survived primary flight training moved on to basic flight training where they would begin the process of becoming military flyers. That meant mastering more complex maneuvers in more powerful aircraft.

Coming out of primary training, many of the new pilots had become very proficient in the slow and forgiving primary training aircraft. However, in basic flight training, they were confronted with a larger and faster airplane. Upon arrival at Randolph Field for basic flight training, Philip Ardery was introduced to his new aircraft, a North American BT-14. As Ardery described it, the BT-14s were “extremely complicated and powerful monsters” with “many

---

<sup>594</sup> Ibid., 43.

<sup>595</sup> Ibid., 43.

<sup>596</sup> Ibid., 43.

<sup>597</sup> Ibid., 43.

<sup>598</sup> Ibid., 53.

complexities entirely new to us.”<sup>599</sup> Eugene Fletcher had a similar reaction when introduced to his new aircraft. His first impression of the BT-13, his basic flight instruction aircraft, was that it was an “AIRPLANE” (emphasis in original) unlike the “box kite with an engine” that he had flown in primary flight training.<sup>600</sup> The sheer number of switches, dials, and gauges amazed him. He noted that the plane was so different that the instructor gave the cadets a few hours just to sit in the cockpit and familiarize themselves with the layout.<sup>601</sup> Some cadets were so overwhelmed by their new plane that they “questioned whether they really had the skills to fly it.”<sup>602</sup> Another cadet summed up what was probably in the back of every cadet’s mind when he considered his new aircraft “a very tricky airplane – a cadet killer.”<sup>603</sup> At times, the instructors were no more familiar with the new planes than the cadets were. One cadet lamented that his instructors had had little time on the AT-6 and that “procedures were being changed every other day.”<sup>604</sup>

The mission of the basic schools was to graduate military pilots. Many senior Army Air Force leaders, to include Hap Arnold, did not believe that civilians could adequately impart those skills to the cadets. Therefore, except for a limited trial between 1941 and 1943, the schools were run entirely by Army Air Forces personnel.<sup>605</sup> After a brief transition phase to familiarize him with his aircraft, the cadet moved on to the “diversified” phase of training. This phase included more advanced flying skills such as acrobatics, formation flying and an introduction to

---

<sup>599</sup> Ardery, *Bomber Pilot: A Memoir of World War II*, 19.

<sup>600</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 118.

<sup>601</sup> *Ibid.*, 118.

<sup>602</sup> Watry, *Washout!: The Aviation Cadet Story*, 106.

<sup>603</sup> John L. Frisbee, "On the Way to a Miracle," *Air Force Magazine*, 1982, 75.

<sup>604</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 61.

<sup>605</sup> Craven *et al.*, *The Army Air Forces in World War II*, 569.

instrument and flying at night.<sup>606</sup> In 1939, this phase of training took nine weeks and the flying time was reduced from one hundred hours to seventy.<sup>607</sup> This created a controversy over which phase should be cut — the transition phase, where the cadet learned to master the aircraft or the diversified phase, where the student learned to master advanced flying techniques.<sup>608</sup>

In 1943, the Flight Training Command made the decision to reinforce the transition phase and reduce the diversified phase. This decision gave the cadets more time to become more familiar with their aircraft before moving on to the diversified phase. Nevertheless, reports from the field soon indicated that pilots were deficient in navigation and formation flying, two critical combat skills that were part of the diversified phase.<sup>609</sup> These skills were added back into the program, but during the middle of the war, it was a zero sum game. Until 1944, in the years when there was a critical need for pilots, the AAF could not add hours to the program to produce proficient pilots, so the difference was made up by cutting other training in the transition phase.<sup>610</sup> However, by 1944, as the need for pilots was not as critical, much of the training that had been cut earlier was restored and the course was extended to ten weeks.<sup>611</sup>

The student-teacher ratio in basic flight training was one instructor per three-and-a-half students, and there was one airplane for each two students, and one Link simulator for every 25 students.<sup>612</sup> However, early in the war, when there was a shortage of instructors, the ratio was as

---

<sup>606</sup> Ibid., 570.

<sup>607</sup> Ibid., 570.

<sup>608</sup> Ibid., 570.

<sup>609</sup> Ibid., 570.

<sup>610</sup> Ibid., 570.

<sup>611</sup> History Central Flying Training Command (History CFTC), quoted in Craven *et al.*, *The Army Air Forces in World War II*, 570.

<sup>612</sup> Memorandum on Flight Training, 1941.

high as one instructor for seven cadets.<sup>613</sup> All of the instructors were Army officers. Some had hundreds of hours of experience in flying, and others were newly commissioned pilots. This may account for the varying introductions the cadets received. One cadet received an unofficial test. As he recalled, the instructor would give control of the plane to a student and see how low to the ground or treetops the student would go.<sup>614</sup> He found out later that the instructor wanted to find out if he was “ground shy.”<sup>615</sup> Eugene Fletcher’s basic flight instructor informed the cadets that they would be tested on cockpit layout while blindfolded.<sup>616</sup> In order to pass, the cadet was required to touch each gauge or lever as the instructor called them out.<sup>617</sup> Fletcher also recalled asking for help with some particularly difficult maneuvers. His instructor refused to assist him. Instead, he insisted that the best way for Fletcher to learn was to practice the maneuver himself and cautioned Fletcher: “If you’re going to fly, either master all the arts of flying or forget it.”<sup>618</sup> However, Charles Watry suggested that this method of teaching and learning may not have always had the intended effect. He noted that some of his peers refused to practice maneuvers if they were flying solo. Instead, they would fly “straight and level for the entire flight period.”<sup>619</sup> He recalled that these cadets eventually “washed out.”<sup>620</sup>

They were also introduced to two new methods of instruction —the “buddy ride” and the Link trainer. The “buddy ride” technique sent two cadets up together to train without an

---

<sup>613</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 63.

<sup>614</sup> Ardery, *Bomber Pilot: A Memoir of World War II*, 19.

<sup>615</sup> *Ibid.*, 19.

<sup>616</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 116.

<sup>617</sup> *Ibid.*, 116.

<sup>618</sup> *Ibid.*, 123.

<sup>619</sup> Watry, *Washout!: The Aviation Cadet Story*, 106.

<sup>620</sup> *Ibid.*, 106.

instructor. Having the cadets train themselves was almost a necessity given the ratio of instructors and planes to students. However, it did occasionally lead to accidents. After one accident where Watry was the co-pilot for a classmate, he laconically recalled: “he wasn’t all that swift as a pilot.”<sup>621</sup> Eugene Fletcher’s major complaint with this method was that the cadet in the back seat did not always get to log flight time.<sup>622</sup>

The Link trainer was an early flight simulator used to help the students master instrument flying. It consisted of a small replica of an airplane, complete with wings and a functional cockpit. The cadet sat inside the enclosed cockpit, and the “plane” moved in response to his control inputs. In addition, an instructor, sitting at a control panel, could induce various inputs to test the student. Crude by modern standards for simulators, many of the instructors in Flight Training Command considered it a terrific training device because it was safer, cheaper, and a marvel of technology. Nonetheless, the cadets, preferring actual flight to simulated flight, did not necessarily share this admiration. Charles Watry jokingly recalled that he and his peers did not hold the Link trainer in high regard and believed that “any resemblance to flying the Link trainer and flying an actual aircraft was pure coincidence.”<sup>623</sup> Nevertheless, the cadets were required to spend 25 hours in the Link trainer.

The two most critical and difficult portions of training were flying by instruments and flying at night. In late 1942 reports from the field requested that more instruction on these two critical skills be added to primary flight instruction.<sup>624</sup> However, as noted in the official history, this attempt was “unsuccessful” because these skills were considered too advanced for pilots in

---

<sup>621</sup> Ibid., 115.

<sup>622</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 134.

<sup>623</sup> Watry, *Washout!: The Aviation Cadet Story*, 108.

<sup>624</sup> Craft, *Embry-Riddle at War: Aviation Training during World War II*, 177-179.

primary flight training.<sup>625</sup> In addition, the Army Air Force's accident data indicated that the accident rate for flying at night was two to four times greater than flying in daytime.<sup>626</sup> There was an ongoing debate on what phase of flight training should address these two skills. For a time they were considered too difficult for cadets in basic flight training, the phase where the cadets moved into more advanced aircraft. However, the officers supervising the advanced flight training program, the last phase, argued that learning to fly instruments and flying at night were too critical to a pilot's success in combat to leave to the last phase of pilot training.<sup>627</sup> For Arnold the issue was where to assume the risk. Was it better to risk losing pilots in training or lose them in combat? According to Arnold:

They must receive training which will enable them to undertake their combat missions safely, and to do this...their own safety requires that they be trained in night and bad weather flying, which of course, raises the accident rate here, but which tremendously reduces the combat losses abroad.<sup>628</sup>

Instruction in flying by instruments and flying at night remained in the basic curriculum.

Flying by instruments was essential to flying at night and was considered a critical skill for flying combat missions at any time and in any weather conditions. The Air Corps' tragic experience flying the airmail in 1934 reinforced this idea that flying at night was a practical skill that was beneficial for any pilot. However, the groups and squadrons in the field did not believe

---

<sup>625</sup> Craven *et al.*, *The Army Air Forces in World War II*, 569.

<sup>626</sup> United States Army Air Forces. Office of Flying Safety, *Safety as a Factor in the Future of Aviation* (Washington DC: Chamber of Commerce of the United States of America, 1946), 44.

<sup>627</sup> History, CFTC, quoted in *Ibid.*, 570.

<sup>628</sup> General Henry Arnold, *New York Times*, 30 October 1943.

there was enough emphasis on instrument instruction in the basic phase.<sup>629</sup> This was a position supported by some of the cadets. Charles Watry noted that many of his classmates did not believe that the instrument instruction they received had adequately prepared them for the flying they would do in theater.<sup>630</sup>

The official history attributed this deficiency to three causes. The first was the attitude of the instructors. One cadet noted that most instructors considered teaching cadets to fly on instruments to be a boring chore. On a typical training flight, the cadet would usually fly straight and level and not engaged in “radical maneuvers,” making the instructor merely a passenger for the majority of the flight.<sup>631</sup> Second were the training methods. At the beginning of the war, the training reflected the “traditional peace-time attitude of training officers who subordinated instrument work to conventional visual maneuvers.”<sup>632</sup> Last was the time and equipment used in the training. Much of the responsibility for the preparation of the equipment and aircraft was placed on the cadets. Fletcher recalled that aircraft were assigned to different aspects of flight training based on their instrumentation. For instance, according to Fletcher, some had better navigation instrumentation and were used for instrument and cross-country flights; those with less advanced instrumentation were used for aerobatics.<sup>633</sup> Regardless, it was the responsibility of the cadet to insure that he had the right aircraft for that day’s training.<sup>634</sup>

The deficiency was also attributed to the reduction in training time. At the beginning of the war, until complaints came in from the squadrons and groups in the field, if something had to

---

<sup>629</sup> Craven *et al.*, *The Army Air Forces in World War II*, 570-571.

<sup>630</sup> Watry, *Washout!: The Aviation Cadet Story*, 108-109.

<sup>631</sup> *Ibid.*, 110.

<sup>632</sup> Craven *et al.*, *The Army Air Forces in World War II*, 570.

<sup>633</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 122.

<sup>634</sup> *Ibid.*, 122.

be cut from the program of instruction, it would be instrument training. Some of the problem can be attributed to the Army Air Force's training methods. After the initial instruction on the ground and demonstration in the air by the instructor, the remaining training flights were conducted using the previously mentioned "buddy training." One cadet rode in the backseat watching for other aircraft while the cadet pilot being trained flew the plane from the front seat. The cadet pilot wore a special hood that limited his vision to just the instrument panel.<sup>635</sup> Without an instructor supervising the flight, the quality of the training would depend on the proficiency of the two cadets. In addition, the Army Air Force did not incorporate all of the instruments into the training. As the official history summed it up, "Gyroscopic instruments were practically ignored." Some instructors did nothing to correct that deficiency.<sup>636</sup> One cadet recalled being cautioned by his instructor not to "pay any attention to these newfangled instruments, they're no good."<sup>637</sup> It was only in June 1943, after observing the Navy's instrument training, that the Army Air Force updated its program of instruction.<sup>638</sup>

Nonetheless, despite these shortcomings, the majority of pilots moved on to the advanced phase of training. For example, 87 percent of Philip Watry's basic class moved on to the next phase of their flight training.<sup>639</sup> This is comparable with the wartime average of 88 percent.<sup>640</sup> Eugene Fletcher ended basic with 36 hours and 20 minutes of dual instruction and 43 hours and

---

<sup>635</sup> Ibid., 134.

<sup>636</sup> Craven *et al.*, *The Army Air Forces in World War II*, 570.

<sup>637</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 320.

<sup>638</sup> Ibid., 571.

<sup>639</sup> Watry, *Washout!: The Aviation Cadet Story*, 118.

<sup>640</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 65



40 minutes of solo flight time. By the time he moved on to his advanced flying school he had 145 hours of military flight instruction.<sup>641</sup>

Coming out of basic flight training, the cadets, based on a recommendation from their instructors, would be assigned to either advanced single-engine or twin-engine training. The objective for both, initially, was similar — “combat proficiency in a single-engine aircraft”<sup>642</sup> or “combat proficiency in a twin-engine military aircraft.”<sup>643</sup> The former goal was modified later to state that the graduate was qualified “to take the assignment of wingman in a tactical organization in any theater of operations.”<sup>644</sup> The latter goal was modified to a focus on preparation “for assignment to multi-engine units” since the AAF operated various multi-engine airplanes in diverse organizations.<sup>645</sup> The changes were made to reflect the role that the new pilot would play in the Army Air Force after graduation. Nonetheless, the number of hours was identical in both schools. The principal difference was a greater emphasis on instrument flying and the absence of acrobatics in the program of instruction for twin-engine flight training.<sup>646</sup>

The ratio in advanced flight training, for both single- and twin-engine aircraft was one instructor for every four students, one airplane for every two students, one Link trainer for every 25 students, and, for single-engine, one tow target airplane per twelve students.<sup>647</sup> The number of flight hours remained constant throughout the war at 70 until 1944 when the course was

---

<sup>641</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 146.

<sup>642</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 66.

<sup>643</sup> *Ibid.*, 82.

<sup>644</sup> *Ibid.*, 66.

<sup>645</sup> *Ibid.*, 82.

<sup>646</sup> Program of Instruction, Advanced Flying Training, Two-Engine; TC Memo 50-10-2, 19 Apr. 1944. .

<sup>647</sup> Memorandum on Training, 1941.

lengthened to ten weeks and nine more flight hours were added.<sup>648</sup> However, based on reports from the squadrons and groups in the field parts of the program of instruction received more emphasis. For example, formation flying went from five hours in early 1943 to fourteen by the end of the year.<sup>649</sup>

Ground school hours varied based on the needs of the force. Shortly after the war began, the hours were dropped from 80 to 67 and by 1943 were reduced further to 60.<sup>650</sup> As the number of pilots needed decreased and as the course was lengthened, the hours were increased to 112.<sup>651</sup> That increase included more emphasis on navigation and weather training.<sup>652</sup> However, ground school was valued no more highly in this phase than in the previous phases.<sup>653</sup> Fletcher thought that the ground school instruction was rushed and there was no time for in-class discussions, just lecture after lecture.<sup>654</sup>

For some of the cadets there was concern about starting the training process all over again. Many were anxious to finish their training and get into the war. One cadet recalled running into a friend who had washed out during primary pilot training. He was envious that his friend was wearing aerial gunner wings and was on his way to bombardier school. He was envious because his friend at least had wings while his own fate was still uncertain.<sup>655</sup>

---

<sup>648</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 87.

<sup>649</sup> *Ibid.*, 87.

<sup>650</sup> *Ibid.*, 68.

<sup>651</sup> *Ibid.*, 68.

<sup>652</sup> *Ibid.*, 68.

<sup>653</sup> Eugene Fletcher noted that since their husbands were about to be commissioned officers, the wives were given their own block of instruction. They were cautioned by the base commander's wife that "it was their duty to be good hostesses and support their husbands at all times." Fletcher, 160-161.

<sup>654</sup> *Ibid.*, 159-160.

<sup>655</sup> Watry, *Washout!: The Aviation Cadet Story*, 124-125.

There may have been some justification for his concern. Once again, the fate of the cadets was in the hands of their new instructors, and cadets had different reactions and experiences depending on which instructors they drew. For example Philip Ardery credited his instructor for instilling in him the attitude that “a pilot should have infinite coolness in emergencies, but also the caution to ensure that the only emergencies he ever meets are those not of his own making.”<sup>656</sup> Charles Watry recalled that his instructor was a “slight man, thin, and nervous,” and that he smoked heavily.<sup>657</sup> The rumor among the cadets was that the instructor had been on the Doolittle Raid.<sup>658</sup> Watry thought that, if that was what caused him to be jumpy, then he should not have been instructing “green cadets.”<sup>659</sup> One instructor informed his cadets that it was not his responsibility to teach them how to fly; they should have learned how to fly in primary and basic flight school. The purpose of advanced flight training was to hone their skills and teach them advanced techniques.<sup>660</sup> Nevertheless, he did tell his cadets that he would help “as needed.”<sup>661</sup> Fletcher recalled that his instructor informed them that, for the first two weeks, he would fly in the “right-hand” or co-pilot seat and for the rest of the course he would only be an observer.<sup>662</sup> Otherwise, flying the plane was totally in the hands of the cadets.<sup>663</sup> However, the specific approach to training varied from instructor to instructor.

Philip Ardery was held over to be an instructor and took a different approach to his students, perhaps because he had recently been in their shoes. Being more tolerant of student

---

<sup>656</sup> Ardery, *Bomber Pilot: A Memoir of World War II*, 23.

<sup>657</sup> Watry, *Washout!: The Aviation Cadet Story*, 191, 127.

<sup>658</sup> *Ibid.*, 127.

<sup>659</sup> *Ibid.*, 127.

<sup>660</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 149.

<sup>661</sup> *Ibid.*, 149.

<sup>662</sup> *Ibid.*, 149.

<sup>663</sup> *Ibid.*, 149.

mistakes, Ardery was rewarded by being given other instructors' "problem cadets" to "straighten out."<sup>664</sup> He said that the practice of giving more chances to pilots increased as the need for pilots became more acute.<sup>665</sup> In addition, he said that cadets who would have been eliminated earlier were given second chances.<sup>666</sup> However, these marginal pilots would come back to haunt the Army Air Force as the squadrons and groups in the field had to deal with them.<sup>667</sup> Even before the cadets left the program, Ardery admitted, he sometimes found himself to be repeatedly correcting the same mistakes in each of his four students.<sup>668</sup> Ardery recalled seeing his best friend and fellow instructor killed in a crash. He said that, at the time, "a lot of the fun went out of my flying... [but]...my attention to it was more intense...."<sup>669</sup> In other cases it was the chain of command that was making life difficult for the instructors. For example, at an airfield that was responsible for training navigators, the base commander required all instructor pilots to pass an eight-page, 117 question exam before operating the AT-7 twin-engine plane.<sup>670</sup> This was followed by a check ride with the results countersigned by a certified pilot.<sup>671</sup> Only then was the instructor pilot deemed qualified to take navigator cadets up on training flights.

---

<sup>664</sup> Ardery, *Bomber Pilot: A Memoir of World War II*, 39.

<sup>665</sup> *Ibid.*, 39.

<sup>666</sup> *Ibid.*, 39.

<sup>667</sup> US Air Force Historical Division, *US Air Force Historical Study No 11: Personnel Problems Relating to AAF Commissioned Officers, 1939-1945* (Maxwell AFB AL: USAF Historical Division [1951]), 15.

<sup>668</sup> Philip Ardery, *Bomber Pilot: A Memoir of World War II* (Lexington KY: University Press of Kentucky, 1978), 38.

<sup>669</sup> *Ibid.*, 37.

<sup>670</sup> Skelton, *Memoirs of a World War II Pilot*, 92.

<sup>671</sup> *Ibid.*, 92.

Wartime experience indicated that formation flying was a critical skill for multi-engine pilots; especially at high altitude, it was also one of the most difficult skills to master.<sup>672</sup> The program of instruction required pilots to fly in a Vee formation (three aircraft) with approximately five feet of clearance between wingtips.<sup>673</sup> This was a difficult task in clear skies; but at night, it was looked upon with dread.<sup>674</sup> Watry noted that formation flying was a particular challenge as the pilots tried to maintain their proper spacing and altitude.<sup>675</sup> He recalled that after a formation-flying lesson “even virile youngsters are physically drained.”<sup>676</sup>

Another critical task for multi-engine pilots was the ability to fly on only one engine. However, a shortage of twin-engine trainers required some schools to make do with single-engine planes until late 1942.<sup>677</sup> Nevertheless, even in those schools with the proper aircraft, the necessity of this training was not apparent to every cadet. Watry questioned the amount of time spent on single-engine training in a twin-engine airplane. Time, he believed, could have been better spent on training in “more productive areas.”<sup>678</sup> Despite Cadet Watry’s concern about the amount of time spent flying around on one engine in his twin-engine airplane, the Army Air Forces believed differently. Reports from the squadrons and groups indicated it was crucial that a

---

<sup>672</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 89.

<sup>673</sup> *Ibid.*, 93.

<sup>674</sup> *Ibid.*, 90.

<sup>675</sup> Watry, *Washout!: The Aviation Cadet Story*, 118.

<sup>676</sup> *Ibid.*, 118.

<sup>677</sup> USAF Historical Division, *U. S. Air Force Historical Study No. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 83.

<sup>678</sup> Watry, *Washout!: The Aviation Cadet Story*, 114.

pilot learn how to maintain control of his aircraft after the loss of an engine, especially at low level, including landings and take-offs.<sup>679</sup>

Advanced flying training was also a dangerous time for the cadets. The total number of accidents in advanced flight training was slightly more than basic and primary flight training combined. There were 13,511 accidents in advanced flight training aircraft and 13,137 in both primary and basic.<sup>680</sup> This can be attributed to several factors. First, by the time the pilots reached this phase they had passed through a very brutal screening process and were feeling confident in their abilities. This was the phase in a pilot's career when, as Arnold put it, he "becomes overconfident and knows more about flying than he will ever know again."<sup>681</sup> Knowing that the long sought goal of earning their wings was only weeks away only contributed to this overconfidence. Finally, the cadets were transitioning to even more powerful and complex aircraft, especially for the twin-engine pilots. In one cadet's opinion, the AT-17, a twin-engine trainer, was "quite a handful" for pilots with a little over 100 hours.<sup>682</sup> In particular, the cadets had more instruments to monitor and retractable landing gear to keep in mind.<sup>683</sup> Cadets at MacDill AFB in Florida had a pithy saying — "One a day in Tampa Bay" — that demonstrated a

---

<sup>679</sup> USAF Historical Division, *U. S. Air Force Historical Study No. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 89.

<sup>680</sup> United States Army Air Forces, Office of Statistical Control. *Army Air Forces Statistical Digest: World War II*. Washington DC: Office of Statistical Control, 1945, 310.

<sup>681</sup> Arnold and Eaker, *This Flying Game*, 101.

<sup>682</sup> Watry, *Washout!: The Aviation Cadet Story*, 114.

<sup>683</sup> *Ibid.*, 114.

pragmatic view of the accident rate.<sup>684</sup> A 1943 study on accidents summed it up best: “The planes are powerful and the training period is short.”<sup>685</sup>

Graduation from advanced flight training meant that the cadet had not only earned his wings and was a rated pilot, but he was also commissioned as a Second Lieutenant in the U.S. Army Air Force. Charles Watry recalled that the washout rate for his class during advanced training was 2.33% or 7 cadets.<sup>686</sup> A postwar study bears out Watry’s statement. The study noted that through 31 December 1943 the elimination rate was 2.2 percent.<sup>687</sup> However, the rate went up to 9 percent in 1944 when the Army Air Force could be more demanding as result of the decreased demand for pilots.<sup>688</sup> Eugene Fletcher’s class had a slightly higher washout rate and graduated only 237 out of the 250 cadets who had started with him.<sup>689</sup> The overall washout rate for Watry’s class from preflight to advanced flight training was nearly 40 per cent, which was below the anticipated norm of 50 percent.<sup>690</sup> His class began with 4,931 in preflight and graduated 2,966 from advanced.<sup>691</sup> Eugene Fletcher recalled that at the end of advanced flight training he had 26 hours and 30 minutes of dual instruction and 52 hours and 20 minutes of solo flight training plus another 48 hours as co-pilot (these did not count towards his training time) for

---

<sup>684</sup> Donald L. Miller, *Masters of the Air: America's Bomber Boys Who Fought the Air War Against Nazi Germany* (New York: Simon & Schuster, 2007), 166.

<sup>685</sup> United States. Army Air Forces, *Accident Facts: U.S Army Air Forces* (Winston-Salem, NC: The Flight Control Command, [1943]), 48.

<sup>686</sup> Watry, *Washout!: The Aviation Cadet Story*, 144.

<sup>687</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 80.

<sup>688</sup> *Ibid.*, 80-81.

<sup>689</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 161.

<sup>690</sup> Watry, *Washout!: The Aviation Cadet Story*, 144.

<sup>691</sup> *Ibid.*, 144.

126 hours and 50 minutes in the AT-17.<sup>692</sup> His total hours before moving on to transition were 271 hours and 50 min. Transition training was the last phase before deploying to a combat unit. It was also the phase in which the pilot learned to fly the type of aircraft he would operate in combat.

Following World War One and through most of the interwar period, transition training was primarily a function of the tactical units and was subject to the regulations established by the local commander.<sup>693</sup> This changed in 1937 with the introduction of the B-17. For the first time the Air Corps prescribed procedures and qualifications before a pilot could fly a particular aircraft.<sup>694</sup> However, this decision did not result from a sudden concern for the pilot's proficiency or safety, but was due to the expense of the plane.<sup>695</sup> The Air Corps could not afford to lose any of these expensive aircraft. Moreover, the immediate effect was the establishment of standards for all classes of aircraft.<sup>696</sup> Nonetheless, the local commanders were still granted some latitude. The official history summed up transition training, after the beginning of the expansion program, this way: "It still retained some of its informal characteristics of the prewar period, but the greater number and lower experience of the trainees required more definite procedures."<sup>697</sup>

During each phase of training the cadet was allowed a period of time to become familiar with his new aircraft. However, in transition flight training, this was a more difficult undertaking. It was also the phase in which a pilot was less likely to be washed out and most likely to be

---

<sup>692</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 186.

<sup>693</sup> United States Army Air Forces, *Army Air Forces Historical Study, no 18: Pilot Transition to Combat Aircraft*, 16-17.

<sup>694</sup> *Ibid.*, 16-17.

<sup>695</sup> *Ibid.*, 16-17.

<sup>696</sup> *Ibid.*, 16-17.

<sup>697</sup> *Ibid.*, 231.



killed. In 1944, the *New York Times* reported, that the prewar fatality rate of 145 for every 1,000,000 flying hours during this phase of training had increased to 521.<sup>698</sup> Pilots were not only introduced to a more complex aircraft, especially for the four-engine pilots, but they also had to master new flying techniques and procedures to prepare themselves to fly as a members of a squadron or group. As Philip Ardery understood it, the purpose of transition training was not to teach tactics but to acquaint the pilot and crew with the aircraft they would take into combat.<sup>699</sup> For Eugene Fletcher the enormity of the task came home after his first introduction to the B-17. The first thing he noticed apart from the size was the great increase in horsepower, which was ten times greater in the B-17 than in the AT-17 trainers he had flown earlier.<sup>700</sup> To say that he was overwhelmed, he added, “would be a gross understatement.”<sup>701</sup> He also remembered the pressure of realizing that he needed to have a working knowledge of every system on his plane.<sup>702</sup>

To fly its single-seat fighter planes, the Army Air Force wanted aggressive pilots. A postwar study noted: “Aggressiveness...must be developed to a high degree.... Once committed to the attack timidity or hesitancy in driving it home to point-blank range will surely produce disastrous results.”<sup>703</sup> In a postwar history, author Oliver La Farge, commented on fighter aircraft: “As a class they are the most dangerous of all planes to fly....”<sup>704</sup> The men who flew

---

<sup>698</sup> *New York Times*, 16 January 1944.

<sup>699</sup> Ardery, *Bomber Pilot: A Memoir of World War II*, 44.

<sup>700</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 189.

<sup>701</sup> *Ibid.*, 189.

<sup>702</sup> *Ibid.*, 190.

<sup>703</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 292.

<sup>704</sup> Oliver La Farge, *The Eagle in the Egg* (New York: Arno Press, 1972, [1949]), 133.

them, he noted, should be “collectively reckless men.”<sup>705</sup> On the other hand, multi-engine pilots were selected more for their leadership ability, since they would be responsible for not only themselves but also, depending on the type of aircraft, up to nine other men. However, the multi-engine instructors did not necessarily discourage aggressiveness. Eugene Fletcher, after performing an unauthorized maneuver, was told by his instructor: “We don’t usually use or teach that maneuver, but you’re going to a combat theater where you will have to use every maneuver you know in order to survive. That is the sole purpose of your training.”<sup>706</sup>

The transition to single-seat fighters presented a unique challenge. Because of the lack of two-seat tactical combat fighters, a single-engine pilot’s first transition flight was by necessity a solo flight. Moreover, the instruction usually consisted of an experienced pilot leaning into the cockpit and explaining the procedures before the new pilot took off. To mitigate this problem, single-engine transition instruction consisted of an intensive period of ground indoctrination to include testing the pilot, sometimes blindfolded, on the location and operation of controls, before being certified for his first flight.<sup>707</sup> However, as the official history noted, sometimes a new pilot was given so much information to assimilate in a short period that it instilled more alarm than confidence in the pilot.<sup>708</sup>

At the beginning of the war, the Army Air Force required 60 hours of flight time in transition for single-engine pilots. However, a shortage of aircraft along with a pressing need for pilots forced this requirement to be reduced to 40 hours to meet the demand for pilots. For example, in late 1943, despite a shortage of training aircraft, the required quota of 1,200 P-40

---

<sup>705</sup> Ibid., 133.

<sup>706</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 194.

<sup>707</sup> United States Army Air Forces, *Army Air Forces Historical Study, no 18: Pilot Transition to Combat Aircraft*, 104-105.

<sup>708</sup> Ibid., 104-105.

pilots per transition class was met by reducing the amount of transition flight time.<sup>709</sup> As the emergency passed, the hours were increased to between 60 and 110.<sup>710</sup> For multi-engine pilots, transition was a two-stage process: first was learning to operate the new plane and second was picking up his crew. Lasting from four to eight weeks, this latter step gave the crew time to work together and become a team before deployment.<sup>711</sup>

Because this was the last phase of training before combat, there were times during transition training when there was a deliberate compromise between safety and realism. For instance, during single-engine transition, these “collectively reckless men,” as La Farge referred to them, were not allowed to engage in simulated dogfights with live ammunition, certainly a prudent measure by any standard.<sup>712</sup> On the other hand, one base commander, in order to keep down his accident rate, sent his pilots along a well-lit cross-country course; certainly, accidents were fewer but it was perhaps not the best way to prepare pilots for the blackout conditions they would encounter overseas.<sup>713</sup> In 2<sup>nd</sup> Air Force, the amount of flying time in a 24-hour period was monitored to insure crew safety. During transition training for bomber crews this was limited by phase. In the first phase, a crew could fly no more than five hours in twenty-four; the crew was permitted eight hours in the next phase and ten hours in the final phase.<sup>714</sup> Oddly enough, the

---

<sup>709</sup> Ibid., 207.

<sup>710</sup> USAF Historical Division, *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952* (Maxwell AFB AL: USAF Air University, 1953), 305-306.

<sup>711</sup> Craven *et al.*, *The Army Air Forces in World War II*, 568.

<sup>712</sup> Routing and Record Sheet on Flying Safety vs. Training Efficiency, 17 September 1942.

<sup>713</sup> Ibid.

<sup>714</sup> 2nd Air Force, *Second Air Force Flight Training Directive for Combat Crews* (Colorado Springs CO: United States Army Air Forces, 1943), 31

official history labeled one four-engine transition school as too safety conscious while in the next sentence the authors criticized the same school for not emphasizing emergency procedures.<sup>715</sup>

Nevertheless, this training was not without its lighter moments. One training directive required crews to practice bailout procedures once a week. While in flight, the crews moved to their bailout stations and remained there until the plane landed and the props had stopped spinning. The pilot rang the bailout bell and the crew exited the plane through their directed exits wearing their parachutes. The directive concluded with the admonition that crews “will not pull ripcords of parachutes.”<sup>716</sup> It is not too hard to imagine some hapless crewmember dutifully jumping out his plane, as it sat on the ground, and pulling the ripcord as he had been trained to do.

After coming together after their individual training, bomber crews underwent an additional transition phase. This phase lasted from four to eight weeks depending on the time of the war.<sup>717</sup> During the wartime expansion, the Army Air Forces was learning as it went along. By 1943, it was taking a very systematic approach to training by laying out tasks, conditions, and standards with checklists for the evaluators to use to log the progress of the crew throughout the process.<sup>718</sup> The Army Air Forces also relied on much of the preflight testing to help in forming bomber crews. Eugene Fletcher recalled that, in an effort to minimize personality clashes, bomber crews were formed based on the preflight psychological test.<sup>719</sup> In contrast, the RAF

---

<sup>715</sup> United States Army Air Forces, *Army Air Forces Historical Study, no 18: Pilot Transition to Combat Aircraft*, 143.

<sup>716</sup> 2nd Air Force, *Second Air Force Flight Training Directive for Combat Crews*, 31

<sup>717</sup> United States Army Air Forces, *Army Air Forces Historical Study, no 18: Pilot Transition to Combat Aircraft*, 128.

<sup>718</sup> 2<sup>nd</sup> Air Force Fight Training Directive, 1943.

<sup>719</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 198.

formed crews by placing a group of crewmembers in a large hangar telling them to “sort themselves out into crews.”<sup>720</sup> The RAF believed that the airmen would naturally form into teams of similar likes and dislikes.<sup>721</sup> Fletcher further noted that one member of the crew had to be blood type O as a universal donor and no more than two members of the crew could be from the same state.<sup>722</sup> Fletcher’s crew ranged in age from eighteen to twenty-eight and only his flight engineer, as the senior non-commissioned officer, had any previous experience with the B-17.<sup>723</sup>

In his previously mentioned book, *Bombs Away: The Story of a Bomber Team*, Steinbeck not only acquainted readers with the life of a bomber crew but he also emphasized the teamwork required to operate a bomber. In addition, Steinbeck gave the bomber the archetypical “All American” crew. For example, the pilot was a big farm boy from South Carolina, the tail gunner was a “slender, short, wiry young man with stringy muscles, a deadly eye, and no nerves,” and the crew chief was a natural mechanic found “in nearly every small town in America.”<sup>724</sup> However, before Steinbeck’s fictional crew or Fletcher’s real crew formed up to become a team each member had undergone intensive training of his own.

Prior to the war, the Air Corps placed little or no emphasis on bombardier or navigator training. In 1933, the Air Corps established two schools for navigation and instrument training. However, these were closed during the airmail operation. One of the schools briefly reopened in 1934 before it was shut down again at the behest of Brigadier General Frank Andrews, the commander of GHQ Air Force. In place of a centralized school, Frank directed that a twelve-

---

<sup>720</sup> Mark K. Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War* (Essex, England: F. Cass, 1995), 119.

<sup>721</sup> *Ibid.*, 119.

<sup>722</sup> Fletcher, *Mister: The Training of an Aviation Cadet in World War II*, 198.

<sup>723</sup> *Ibid.*, 200.

<sup>724</sup> John Steinbeck, *Bombs Away: The Story of a Bomber Team*, 2nd ed. (New York: Penguin Books, 2009), 44, 116.

week, 246-hour course be developed that could be exported down to the groups to use for training.<sup>725</sup>

It was much the same for bombardier training. The senior leaders of the Air Corps believed that accurate bombing required coordination between the pilot and bombardier. Therefore, they surmised, a good pilot would make a good bombardier and vice versa. However, the squadrons and groups always emphasized pilot training; and, as noted in the Army Air Forces' official history, bombardier training "was performed 'coincidentally' [and] there was neither standardized instruction nor a complete manual to follow."<sup>726</sup> Another history stated: "This type of training interfered with the accomplishment of the essential function of these units, and the individual training was frequently neglected."<sup>727</sup> It is somewhat surprising that the Air Corps was so cavalier about bombardier training given the emphasis it placed on precision bombing as its *raison d'être*. The official history noted that the first bombardier school was not opened until May 1941 and it took an additional nine months for it to become operational.<sup>728</sup>

Flexible gunnery was even more of an afterthought or, as one Air Force history noted, "The [gunnery] training [1919 – 1940] was apparently somewhat superficial and not highly specialized."<sup>729</sup> Curtis LeMay would recall after the war that "Another weakness of ours right from the start was our horrible gunnery. Gunnery was pretty low on the totem pole in

---

<sup>725</sup> Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington DC: Office of Air Force History, U.S. Air Force, 1987), 380.

<sup>726</sup> Craven *et al.*, *The Army Air Forces in World War II*, 467- 468.

<sup>727</sup> United States Army Air Forces, *Army Air Forces Historical Study No. 5: Individual Training of Bombardiers* (Maxwell AFB AL: United States Army Air Forces, Historical Division, 1944), 133.

<sup>728</sup> *Ibid.*, 1.

<sup>729</sup> United States Army Air Forces, *Army Air Forces Historical Study no 31: Flexible Gunnery Training in the AAF* (Maxwell AFB AL: United States Army Air Forces Historical Division, 1945), 4.

peacetime.”<sup>730</sup> Within the Air Corps, there was more interest and experimentation in types of mounts and calibers than in how best to train the gunner.<sup>731</sup> For these reasons, but mainly because of a lack of funds, the Air Corps did not establish a specialized flexible gunnery school until late 1940.

Nonetheless, it was still the responsibility of the tactical groups to train people in these specialties and often the standards were left up to the group commander. For instance, in the 19th Bomb Group the commander set a very high standard for his crews. He did not consider a crew fully trained until every officer was qualified as pilot or co-pilot, celestial navigator, expert bombardier, and expert gunner.<sup>732</sup> All enlisted crew members had to first qualify in their specialties — engineer, armorer, or radio operator — and then were required to become expert gunners.<sup>733</sup>

With the start of the expansion program in 1939, selection of personnel for these positions was reconsidered. During World War One, the Air Service policy had been to offer washed out pilots, or those “not at ease in the work [of flying],” the opportunity to become bombardiers or artillery observers.<sup>734</sup> The Air Corps believed that this policy would once again provide sufficient numbers of bombardiers and navigators. Unfortunately, the Air Corps failed to heed its own history. During World War One, the perception among those in the Air Service was

---

<sup>730</sup> LeMay *et al.*, *Strategic Air Warfare: An Interview with Generals Curtis E. LeMay, Leon W. Johnson, David A. Burchinal, and Jack J. Catton*, 25.

<sup>731</sup> United States Army Air Forces, *Army Air Forces Historical Study no 31: Flexible Gunnery Training in the AAF*, 3-4.

<sup>732</sup> Maurer, *Aviation in the U.S. Army, 1919-1939*, 381.

<sup>733</sup> *Ibid.*, 381.

<sup>734</sup> Memorandum from Lieutenant Colonel F. R. Kenney to the Training Section of the Air Service, 19 July 1918, quoted in Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 138.

that bombardiers were “Second Grade Men” in relation to the pilots.<sup>735</sup> Once the Air Corps began transferring or offering washed out pilots the opportunity to become bombardiers or navigators, the same phenomenon took place. The washed out cadet faced two humiliations: first, he had failed to become a pilot and, second, everyone on the crew knew it as well. In addition, the dropouts were initially recycled through preflight training where they, as one instructor noted, were “unduly alarming the cadets in the replacement center [and, because they were sharing their experiences,] were further destroying morale by causing cadets to come to primary school apprehensive and nervous.”<sup>736</sup> On the other hand, some actually chose to be aircrew rather than pilots. Ralph Nutter joined to be a fighter pilot the day after Pearl Harbor, but after arriving at the training facility at Montgomery, Alabama and being told to go home and wait to be called, he elected to transfer to navigator training because he could begin it immediately.<sup>737</sup> This problem became less pronounced after the Army Air Forces developed selection criteria for bombardiers and navigators.

The instructors and staff at both the bombardier and navigator schools argued that they should get cadets with the skills necessary for their respective specialties. However, the counterargument from the Army Air Forces Staff was that, with the washout, the schools were receiving a trainee who had already gone through two screenings for educational ability and was already familiar with the military customs and courtesies.<sup>738</sup> The argument based on skill eventually won out as the Army Air Force refined the selection process and gained more

---

<sup>735</sup> Ibid., 141.

<sup>736</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944*, 49.

<sup>737</sup> Ralph H. Nutter, *With the Possum and the Eagle: The Memoir of a Navigator's War Over Germany and Japan* (Novato CA: Presidio, 2002), 4.

<sup>738</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 337.



experience and confidence in the Standard Nine classification system discussed in Chapter 3. However, washouts were still permitted to reclassify and, as one pilot noted, it was not unusual to find several members of a bomber crew who were former pilot cadets.<sup>739</sup>

Specialized bombardier training did not begin in earnest until after Pearl Harbor. The amount of time allotted to training gradually increased over the course of the war from twelve to 24 weeks and dropped briefly to ten weeks in 1942.<sup>740</sup> The course was divided into two phases: the ground phase and the air phase. Much like pilot training, ground training emphasized the physics and theory behind dropping bombs from an airplane.<sup>741</sup> Air training put the theory into practice and made up the majority of the time, almost three quarters of the time during the twelve-week course.<sup>742</sup> The eighteen-week course included 425 hours of ground instruction including time on the A2 trainer, a bombing simulator. After three weeks on the ground, the student began training in the air. Over the course of his training, the bombardier would drop between 155 and 200 bombs from various altitudes and conditions. For qualification, he would fly seven bomb runs, four in daytime and three at night, and had to place his bombs within 230 feet of the aim point to be considered qualified.<sup>743</sup>

Of the three positions — pilot, bombardier, and navigator — navigators required the highest stanine score because of the math skills required for navigation. The navigator's course began in July 1940 as a ten-week course; however, one year later it was increased to fifteen

---

<sup>739</sup> Watry, *Washout!: The Aviation Cadet Story*, 58.

<sup>740</sup> Nalty *et al.*, *With Courage: The U.S. Army Air Forces in World War II*, 173.

<sup>741</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 5: Individual Training of Bombardiers*, 40-41.

<sup>742</sup> *Ibid.*, 41.

<sup>743</sup> Watry, *Washout!: The Aviation Cadet Story*, 191, 154.

weeks.<sup>744</sup> In 1943, it was reduced to twelve weeks to meet the wartime demand and remained at twelve weeks for the duration of the war.<sup>745</sup> Nonetheless, in 1943 Arnold wanted to reduce the time even more. After the war, General O.P. Weyland recounted that Arnold had told him to cut the training time in half to “turn them out faster.”<sup>746</sup> However, there was a limit to how much could be cut from the course and still produce a proficient navigator. Each cadet received 500 ground hours and 100 air hours of instruction. Cadets flew 20 navigation flights, rotating between primary navigator and merely plotting the course as the training flight progressed.<sup>747</sup> To earn their navigator’s wings, they had to be able to navigate with no more than a one-and-a-half degree course error and no more than one-and-a-half minutes of error per flight hour. At night, students had to arrive within fifteen miles of their objectives.<sup>748</sup> In addition, they received six weeks of gunnery training, if the gunnery school had space.<sup>749</sup>

Aerial gunnery training began as a five-week course and was increased to six weeks over the course of the war as the demand for gunners decreased.<sup>750</sup> At first, the Army Air Forces relied on volunteers; however, when this did not meet the demand, they lowered the standards and turned to compulsory selection.<sup>751</sup> The Army Air Forces’ leaders were initially concerned about the effect of this action; the Air Staff expected a washout rate of at least 35%.<sup>752</sup> Their

---

<sup>744</sup> United States Army Air Forces, *Army Air Forces Historical Study no. 27: Individual Training of Navigators in the AAF* (Maxwell AFB AL: United States Army Air Forces Historical Division, 1945), 73.

<sup>745</sup> *Ibid.*, 74.

<sup>746</sup> General O. P. Weyland interview, (United States Air Force Oral History Program, 23 July 1974).

<sup>747</sup> Watry, *Washout!: The Aviation Cadet Story*, 191, 157.

<sup>748</sup> *Ibid.*, 157.

<sup>749</sup> *Ibid.*, 156.

<sup>750</sup> United States Army Air Forces, *Army Air Forces Historical Study no 31: Flexible Gunnery Training in the AAF*, 84.

<sup>751</sup> *Ibid.*, 98.

<sup>752</sup> *Ibid.*, 98.

fears were never realized, and the new recruits began to perform as well as the volunteers.<sup>753</sup>

This was largely the result of an intensive campaign to sell aerial gunnery. These efforts included the 1943 training film, “*The Rear Gunner*” that referred to the gunners as “aviation’s mightiest little men,” perhaps building on Steinbeck’s characterization of them.

However, to train the aircrew, the Army Air Force also had to divert pilots and planes to these training centers. The ratio for navigators was one airplane per ten students and one instructor per twelve students. For bombardiers it was one airplane per four students with one instructor per six students, and one bomb trainer per 7.7 students. For gunnery training, the ratio was one gunnery airplane per ten students as well as one tow target airplane per ten students, and one instructor per 20 students.<sup>754</sup> However, no matter how important it was to fly these cadets around so they could perfect their skills, it was not always a duty that the pilots necessarily found desirable. Nor was it necessarily a safe assignment for pilots, either. One pilot assigned to that duty out of flight school recalled that three out of the 22 pilots who had reported in with him died in crashes and one was discharged with stomach ulcers.<sup>755</sup>

The units in the field continually sent advice and criticisms to the air staff about the quality of the aircrew they were receiving from the training centers. The combat squadrons and groups were concerned about the amount of time they had to spend training the incoming personnel. Depending on the phase of the war, they would have to devote up to six weeks in training and preparing a new pilot or crew before allowing them to fly operationally.<sup>756</sup> The major complaint about fighter pilots was the inadequacy of gunnery and high-altitude training. In

---

<sup>753</sup> Ibid., 98.

<sup>754</sup> Memorandum on Training to the Chief of Staff of the Air Corps, 1941.

<sup>755</sup> Skelton, *Memoirs of a World War II Pilot*, a. 450, 89.

<sup>756</sup> United States Army Air Forces, *Army Air Forces Historical Study no 61: Combat Crew and Unit Training in AAF, 1939-1945*, 59-60.

early 1942, Lieutenant General George C. Kenney, the commander of the 5th Air Force, reported that only four of 29 replacement pilots had flown a combat aircraft in training.<sup>757</sup> Of course, this was early in the war when the Army Air Forces was still trying to determine the balance between meeting the demands of the field and training pilots. In another instance, a combat crew reception center in England reported, in 1943, that the crews coming through the center were “seriously deficient” in gunnery, formation flying, and “coordination between pilots and bombardiers.”<sup>758</sup> As for the crews themselves, many were asked to fill out questionnaires about their training, and their answers supported the opinion of the overseas commanders about the deficiencies in training.<sup>759</sup> Some of these men obviously voiced these concerns to their families. For example, the family of a P-47 pilot with the 56<sup>th</sup> Fighter Group are still dismayed that this young man was sent to war with only six weeks of flight training and believe this contributed to his death in July 1944.<sup>760</sup> Further research revealed that he had received the full amount of flight training and the six weeks they referred to was his transition time in the P-47, and, at the time of his training, in all likelihood, he had received 60 hours of flight time. It has been noted previously that 60 hours was above the average for transition training. However, as the official history observed, “These criticisms [from the squadrons and groups]...in time became less sweeping in nature...for as the pressure of the first hectic year passed, Headquarters, AAF and the subordinate air forces were able to evolve more successful programs for both fighter and bomber training.”<sup>761</sup> Nonetheless, no matter how successful these programs were in producing

---

<sup>757</sup> Ibid., 60.

<sup>758</sup> Ibid., 61.

<sup>759</sup> Ibid., 61.

<sup>760</sup> Interview with family members of Lieutenant Sam Dale, July 2012.

<sup>761</sup> Ibid., 62.

proficient pilots and crews, flying accidents were still an unpleasant fact for those in the Army Air Forces.

## Chapter 5 - The Accidents: Causes and Prevention

Let us not gloss over the fact that the combat flying is a grim and dangerous business . . . From the outset, the Army Air Forces have taught the men at home the maneuvers that they would execute in combat abroad. In these maneuvers a few are bound to be injured or killed, but the overwhelming proportion of the men are better prepared to defeat the enemy.”<sup>762</sup>

General Henry “Hap” Arnold

*Report of the Commanding General of the  
Army Air Forces to the Secretary of War*

A gruesome weeding out process was taking place. Those who were killed in Nevada were likely to have been the first killed in combat.<sup>763</sup>

Charles “Chuck” Yeager

*Yeager, An Autobiography*

Both “Hap” Arnold and “Chuck” Yeager attested to the danger inherent in flying both in combat and in training. In addition, both suggested that, however unfortunate, airmen were going to be killed in training. Nevertheless, the payoff for those losses would be a large group of pilots better prepared to meet the rigors of combat and, in Yeager’s opinion, it was better that the “weak sisters,” as he referred to them, were killed in training than in combat.<sup>764</sup> Late in the war, Arnold noted in his annual report to the Secretary of War:

---

<sup>762</sup> United States Army Air Forces and Henry Harley Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War*, (Washington DC: US GPO, 1944), 317.

<sup>763</sup> Chuck Yeager and Leo Janos, *Yeager: An Autobiography* (Toronto; New York: Bantam Books, 1985), 15.

<sup>764</sup> *Ibid.*, 15.

Twenty years' accumulation of experience, by a comparatively small and fixed group of men, brought the AAF accident rate down to 51 per 100,000 hours in 1940. Expansion introduced a new and enormous block of inexperience, which would tend to reproduce the situation of the early Twenties. Vigorous preventive measures were taken against the expected rise. The degree of success can be measured by the fact that the accident rate has been held down and new all-time lows attained.<sup>765</sup>

He further noted, in the same report, that accidents had risen, but not out of proportion to the increased volume of cadets in training.<sup>766</sup> Arnold went on to add that the Army Air Force was flying higher performance aircraft and carrying more personnel and, as a result, the rate of fatal accidents went up from .077 to .083 per one thousand.<sup>767</sup> Nonetheless, Arnold concluded his report in a positive manner claiming that 95 of every 100 pilots in training “can be expected to fly through the next twelve months without a scratch.”<sup>768</sup> In a *New York Times* article, Arnold suggested that accidents in training were inevitable and were part of the cost to prepare for war. He stated: “They [the trainees] must receive training which will enable them to undertake their combat missions safely, and to do this...their own safety requires that they be trained in night and bad weather flying, which, of course, raises the accident rate here, but which tremendously reduces the combat losses abroad.”<sup>769</sup> He went on to add, “It would be short-sighted and

---

<sup>765</sup> United States Army Air Forces and Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War*, 318.

<sup>766</sup> *Ibid.*, 317.

<sup>767</sup> *Ibid.*, 318.

<sup>768</sup> *Ibid.*, 318.

<sup>769</sup> *New York Times*, 30 October 1944.

unfair...to sacrifice men and equipment in combat for the sake of making an apparent reduction in aircraft accidents.”<sup>770</sup>

Nevertheless, the Army Air Forces, led by Arnold, would be beset with a number of accidents that, while equal or lower than the prewar rate, were on a scale the Air Corps had never before had to endure (Table 4). For example, during the first 32 months of the war, the Army Air Forces lost 3,300 more planes in accidents in the continental United States than in combat.<sup>771</sup> In late 1944, the *New York Times* reported that, since the start of the war, 11,000 flyers had been killed in 5,600 accidents in the United States alone.<sup>772</sup> On the other hand, the prewar Air Corps might suffer 50 fatalities in a year while the wartime Army Air Force could suffer that many fatalities during five days of training. A postwar report on flying safety further suggested that the prewar Air Corps might not have been attuned to safety as well as the Army Air Forces became. The report stated: “If sufficient experience could have been gained prior to wartime expansion, therefore, it is conceivable that accident rates could have been reduced sooner, thereby eliminating many of the accidents occurring in the early months of trial and error.”<sup>773</sup> Arnold stated in a *New York Times* interview that “he was constantly reviewing accident problems and that he took prompt action against any air force personnel who failed to follow safety instructions or to maintain the new standards of discipline and efficiency necessary for safe operation.”<sup>774</sup> It is unclear if the “new” standards Arnold referred to were recent additions or

---

<sup>770</sup> Ibid.

<sup>771</sup> United States Army Air Forces. Office of Flying Safety, *Safety as a Factor in the Future of Aviation* (Washington DC: Chamber of Commerce of the United States of America, 1946), 4.

<sup>772</sup> *New York Times*, 5 October 1944.

<sup>773</sup> Ibid., 17.

<sup>774</sup> *New York Times*, 30 October 1943.



changes to prewar standards. In either case, the Air Force was becoming more safety conscious as it searched for responses to the accident rate.

“Accident prevention is a lofty goal,” the introduction to the 1943 edition of *Accident Facts* declared.<sup>775</sup> *Accident Facts* was a collection of accident data published jointly by the Research and Statistic Division and the Safety Education Division. Both were subordinate organizations within the Office of Flying Safety. The author of the introduction went on to inform the reader: “It is your job. It is the job of every officer in the Army Air Forces to see that accidents are reduced; if possible, eliminated.”<sup>776</sup> This led, at times, to some interesting reactions. Charles Watry, a cadet at La Junta Army Air Field, recalled that La Junta was known as a “beno” field, as in “There will ‘beno’ flying under bridges,” or “There will ‘beno’ buzzing,” and most important of all, “There will ‘beno’ accidents.”<sup>777</sup> Nevertheless, as to be expected, despite such admonishments, the accidents continued.

In February 1941, the Air Corps reported that more flyers, 27, had died in flying accidents in 1940, than in the previous year.<sup>778</sup> A spokesman for the Air Corps told the *New York Times* that an intense investigation was underway.<sup>779</sup> However, just the day before the Air Corps had reported that the accident rate had been decreasing as a result of “the higher physical and mental standards of pilot material, the excellence of the Army training system and the quality of aircraft.”<sup>780</sup> A year later, with the country at war, the Air Corps was still trying to balance the

---

<sup>775</sup> United States Army Air Forces, *Accident Facts: U.S Army Air Forces* (Winston-Salem NC: The Flight Control Command, 1943), 1.

<sup>776</sup> *Ibid.*, 2.

<sup>777</sup> Charles A. Watry, *Washout!: The Aviation Cadet Story*, 1st ed. (Carlsbad CA: California Aero Press, 1983), 133.

<sup>778</sup> *New York Times*, 9 February 1941.

<sup>779</sup> *Ibid.*

<sup>780</sup> *New York Times*, 8 February 1941.

accident rate with the quality of cadets. In a February 1942 press release, the War Department referred to the increase in aircraft accidents and fatalities since the start of the war noting,

...that the accident rate has been steadily decreasing over a period of years, but with greatly increased volume of training and operations the actual number of accidents increases proportionally, while the rate remains the same. The lowering rate of accidents is due to the higher physical and mental standards of pilot material, the excellence of the Army training system and the quality of aircraft. All of these standards must be maintained in order to protect the flying personnel in the face of the increased pressure on training and the greater speeds and performance of modern aircraft.<sup>781</sup>

A few months later Secretary of War Henry Stimson reported to the *New York Times* that the Army Air Forces accident rate was ten percent lower than the average between 1930 and 1940, adding that the Army Air Forces was emphasizing to the pilots that it was “their duty is to kill the enemy and not themselves.”<sup>782</sup>

Even at the time, many commentators understood it to be inevitable that in flight training cadets would continue to kill themselves throughout the war. Before the United States entered the war, Brigadier General Herbert A. Dargue, in a *Time* magazine article, stated: “Let us face this situation with a calm realization that preparation for war takes its toll as well as war itself and that there is no more hazardous profession at arms than that which the combat flier has

---

<sup>781</sup> *New York Times*, 7 February 1942.

<sup>782</sup> *New York Times*, 17 July 1942.

elected to follow.”<sup>783</sup> For the young cadets, the “calm realization” was that death was now a very real possibility. One cadet, Samuel Hynes, recalled in his memoirs:

The reality of death comes to you in stages. First, it is an idea – all men are mortal, as in the syllogism. Then it is something that happens to strangers, then to persons you know, but somewhere else, and at last it enters your presence, and you see death, on a runway or in a field, in a cloud of dust and a column of smoke. . . . At that moment, the life of flying changed.<sup>784</sup>

In mid-1942, within two weeks of beginning operations as a basic flight school, Pecos Army Airfield suffered its first casualties.<sup>785</sup> In June 1943, Pecos airfield reported the deaths of 25 cadets in “weekly crashes.”<sup>786</sup> At Randolph Field, near San Antonio, Texas (sometimes referred to as the “West Point of the Air” by the Air Corps), during a two-month period, in mid-1945, there were 27 accidents, two of them fatal resulting in nine fatalities. Fifteen of these accidents were directly attributed to pilot error and another seven were probably due to it as well.<sup>787</sup> These two months were a particularly tough time for Randolph as half of the accidents and over half of the fatalities Randolph Field experienced in the first half of 1945 were during those same

---

<sup>783</sup> *Time*, 31 March 1941, quoted in Rebecca Hancock Cameron, *Training to Fly: Military Flight Training, 1907-1945* (Washington DC: Air Force History and Museums Programs, 1999), 320.

<sup>784</sup> Samuel Lynn Hynes, *Flights of Passage: Reflections of a World War II Aviator* (New York; Annapolis: F.C. Beil; Naval Institute Press, 1988), 75.

<sup>785</sup> James L. Colwell, "Wings Over West Texas: Pecos Army Air Field in World War II," *West Texas Historical Association Yearbook* 63 (1987), 56.

<sup>786</sup> *Ibid.*, 56.

<sup>787</sup> United States Army Air Forces, *History of the Army Air Forces Pilot School (Specialized VHB) Randolph Field, Texas, Eighth Bimonthly Supplement, 1 May 1945-1 July 1945* (Randolph Field TX: Office of the Historical Editor, Army Air Forces Pilot School, 1945), 225-228.

months.<sup>788</sup> However, as one Tuskegee airman pragmatically pointed out, after his class suffered its first fatality, “the pace of training seldom paused when such tragedies occurred.”<sup>789</sup>

A 1943 War Department press release, prepared by the Office of Flying Safety, noted that during the first nine months of 1942 the fatality rate was only seventeen per 100,000 flying hours.<sup>790</sup> That number sounds reasonable and more acceptable than the actual number of fatalities for that period, which was 1,279.<sup>791</sup> However, the press release overlooked the fact that the total training fatalities for the first four months of 1943 was approaching 1,800, exceeding the final nine-month total for 1942 by nearly 500.<sup>792</sup> In October 1943, Arnold suggested that one reason for the increase in fatalities was the increased number of heavy bombers and troop-carrying aircraft and the fact that they carried larger crews and more passengers resulting in more fatalities whenever one of these aircraft went down.<sup>793</sup> In addition, a memorandum on accident rates for 1943 and 1945 concluded that during that period the Army Air Forces was flying more hours in tactical aircraft (in the advanced and transitional phases of flight training) than trainers and therefore an increase in accidents was to be expected.<sup>794</sup> The report concluded that the accident rate did not increase as much as anticipated.<sup>795</sup>

---

<sup>788</sup> Ibid., 225-228.

<sup>789</sup> Barry M. Stentiford, *Tuskegee Airmen* (Santa Barbara CA: Greenwood, 2012), 46.

<sup>790</sup> War Department Bureau of Public Relations, Press Branch, 1 April 1943.

<sup>791</sup> United States Army Air Forces Office of Statistical Control, *Army Air Forces Statistical Digest: World War II* (Washington DC: Office of Statistical Control, 1945), 308.

<sup>792</sup> Ibid., 308.

<sup>793</sup> *New York Times*, 30 October 1943.

<sup>794</sup> Memorandum for the Chief of the Air Staff from Colonel Stanley M. Umstead, Chief, Supply and Maintenance Division, Office of the Air Inspector, 12 May 1945.

<sup>795</sup> Ibid.

It should be noted that the Women AirForce Service Pilots (WASP) compiled an admirable accident record during the war. The official history of the Office of Flying Safety noted that the accident rate for female pilots, “despite concerns to the contrary, was comparable to the men and for some months was better.”<sup>796</sup> In 1944, the *New York Times* reported that the overall fatality rate for WASP pilots, which ran at .05 fatal accidents per 1,000 flight hours, was lower than the overall rate of .07 per 1,000 hours of flight time for the entire Army Air Force.<sup>797</sup>

The accident rate for men fluctuated over the course of the war, depending on the pace of training and the demand for pilots in the field. In one example from later in the war, the Army Air Forces Medical Office reported that fatalities in training had declined during most of 1944, but they showed a marked increase for the month of December.<sup>798</sup> The Medical Office also reported that the fatality rate during first two months of 1945 was continuing to increase.<sup>799</sup> This was unusual because the trend had been a decrease in accidents during the winter months when there was less flying being done due to the weather. To illustrate the Medical Office’s assertion: On the east coast, the 1<sup>st</sup> Air Force suffered a total of 31 accidents in January 1945, which resulted in eleven fatalities.<sup>800</sup> In February, the number of accidents was reduced to 24, and only seven of these were fatal. However, these seven accidents produced 31 fatalities.<sup>801</sup> March was even worse for 1<sup>st</sup> Air Force. During that month, there were 36 fatalities as the result of 35

---

<sup>796</sup> History of the Office of Flying Safety for December 1943, 51.

<sup>797</sup> *New York Times*, 5 January 1944.

<sup>798</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, Feb ed., Vol. 2 (Washington DC: United States Army Air Forces, 1945), 1.

<sup>799</sup> *Ibid.*, 1.

<sup>800</sup> 1st Air Force, *That You May Live: 1st Air Force Safety Bulletin*, Vol. June (Mitchell Field NY: United States Army Air Forces, 1945), 2-3.

<sup>801</sup> 1st Air Force, *That You May Live: 1st Air Force Safety Bulletin*, Vol. Feb (Mitchell Field NY: United States Army Air Forces, 1945), 2-3.

accidents.<sup>802</sup> Overall, 1<sup>st</sup> Air Force averaged ten accidents and one fatality a day during the first three months of 1945.

Along with the human cost, there was the financial cost. In nearly 98 percent of all accidents that ended in a fatality, the airplane was a total loss.<sup>803</sup> On the other hand, not every accident where the airplane was a total loss resulted in a fatality. For example, in the last six months of 1943, the Army Air Forces lost over 3,000 men and 10,000 aircraft in accidents.<sup>804</sup> However, it should be noted that for that same period, the Army Air Forces had over 100,000 pilots in training and the United States produced over 40,000 aircraft of all types.<sup>805</sup> The Office of Flying Safety estimated the financial cost in lost aircraft and equipment for that period at over \$425,000,000.<sup>806</sup> During the first six months of 1944, the trend in fatalities was on the rise, but the Army Air Forces lost only 2,600 aircraft in accidents, nearly a 9 percent reduction in accidents over the last six months of 1943.<sup>807</sup> In noting this reduction, the Office of Flying safety projected the financial cost for 1944 “at merely a billion dollars.”<sup>808</sup>

In addition, a shortage of both aircraft and fuel contributed to the accident rate and reduced training time for pilots and crews. In 1942, 3<sup>rd</sup> Air Force reported that it was short 55 percent of its heavy bombers for training and had to reduce flight time by 25 percent.<sup>809</sup> As the

---

<sup>802</sup> Ibid., 2-3.

<sup>803</sup> United States Army Air Forces, *Accident Facts: U.S Army Air Forces*, 9.

<sup>804</sup> Memorandum from Colonel George C. Price Chief of Flying Safety to Deputy Chief of the Air Staff, 11 July 1944.

<sup>805</sup> United States Army Air Forces Office of Statistical Control, *Army Air Forces Statistical Digest: World War II* (Washington DC: Office of Statistical Control, 1945), 313.

<sup>806</sup> Ibid.

<sup>807</sup> Ibid.

<sup>808</sup> Ibid.

<sup>809</sup> United States Army Air Forces, *Army Air Forces Historical Study no 61: Combat Crew and Unit Training in AAF, 1939-1945* (Maxwell AFB AL: Air Historical Office, Department of the Air Force, 1949), 53.

official history noted: “In the main . . . [airplane shortages] could not fail to affect training adversely either by delaying the completion of training of groups and crews or by limiting the extent of that training.”<sup>810</sup> For example, the P-38 training program in 1942 and 1943 was seriously affected by the shortage of both P-38’s and the lack of a trainer with dual controls. The P-38 was a complex and powerful twin-engine fighter, and the lack of a dual-control two-seat training version to help new pilots transition made the P-38 a difficult airplane to master.<sup>811</sup> The AAF eventually developed a two-seat model for transition training, but not before there were numerous accidents and a lowering of morale in the P-38 training groups.<sup>812</sup> Another concern was the shortage of high-octane fuel. The official history stated that this shortage was most critical in 1943 and that for the month of October alone the shortage of high-octane fuel caused the loss of 5,558 flying hours and the reduction in output of 60 pilots and 29 bomber crews.<sup>813</sup> This problem was not corrected until mid-1944, when sufficient refineries were operational.<sup>814</sup>

As noted previously, it was in primary flight training that a cadet was more likely to be eliminated for academic deficiency or lack of flying proficiency than he was to be killed in an accident. In fact, the rate for fatalities in primary flight training was below the Training Command average of two per 100,000 flight hours.<sup>815</sup> One cadet attributed the lower rate for primary flight training to the type of aircraft used and to the fact that they flew strictly in daytime and good weather. By contrast, in basic and advanced flight training, the plane that the cadets

---

<sup>810</sup> Ibid., 53.

<sup>811</sup> Ibid., 54.

<sup>812</sup> Ibid., 54.

<sup>813</sup> Ibid., 57.

<sup>814</sup> Ibid., 57.

<sup>815</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 396

flew was more powerful and complex.<sup>816</sup> The cadets were also required to master risky flight maneuvers in all conditions.<sup>817</sup> Football star Tom Harmon recalled, after the war, that his class did not lose a member in training until they transitioned to basic flight training.<sup>818</sup>

After primary flight training, however, the overall elimination rate went down, but the fatality rate went up. The accident rate for primary flight training was 48 per 100,000 flight hours, and 27 per 100,000 flight hours during basic flight training, but the number doubled to 55 per 100,000 flight hours for advanced flight training (Table 5).<sup>819</sup> In one three-month period in late 1944, 64 percent of the fatalities in flight training overall occurred during the advanced phase.<sup>820</sup> Charles Watry recalled that during advanced training there was a rush to get in the required flight hours before graduation and that “as the paced quickened so did the accidents.”<sup>821</sup> A 1943 press release reporting on high-performance aircraft noted: “Planes of this type can never be safe; they are dangerous weapons of war in the hands of youngsters, comparatively inexperienced according to peacetime standards.”<sup>822</sup> Cadets were welcomed to basic flight at Gunter Field, Alabama, with the following words:

You will grow to like the BT-13s. They can act very smoothly, and they almost land themselves... [however] you may believe you are Hot Stuff, after learning snap, slow rolls, and everything else in a primary trainer; however, remember these planes [BT-13s] have a different feel—they are bigger, heavier, containing more gadgets

---

<sup>816</sup> Watry, *Washout!: The Aviation Cadet Story*, 97.

<sup>817</sup> *Ibid.*, 97

<sup>818</sup> Thomas Dudley Harmon, *Pilots also Pray* (New York: Crowell, 1944), 41.

<sup>819</sup> United States Army Air Forces. Office of Statistical Control, *Army Air Forces Statistical Digest: World War II* (Washington DC: Office of Statistical Control, 1945).

<sup>820</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, 2.

<sup>821</sup> Watry, *Washout!: The Aviation Cadet Story*, 132.

<sup>822</sup> War Department Bureau of Public Relations, Press Branch, 1 April 1943.



(flaps, 2 fuel tanks, stabilizer and rudder trim tabs, radio, etc.) and have different reference points than the primary [trainer]....<sup>823</sup>

This admonition must have worked because there were only two American fatalities in the first two years of flight training at Gunter.<sup>824</sup> International officers were another matter that will be discussed later in this chapter.

The Army Air Forces categorized accidents in three groups. Group I included accidents or damage: “(1) Resulting in complete destruction or complete wreck of an aircraft; (2) As a result of collision in the air; (3) As a result of structural failure in the air of the aircraft, engine or propeller; (4) Resulting in the use of parachutes; (5) Resulting in fatalities or major injuries; (6) Involving important or distinguished personages; (7) Resulting in major damage to private property; (8) Resulting from aircraft becoming lost; (9) Involving civil aircraft. “Group II included [a]ll other aircraft accidents not listed above,” while Group III covered [a]ll other aircraft damages not listed above.<sup>825</sup>

Army Air Force Regulation 62-14, “*Reporting and Investigation of Aircraft Accidents*”, required all Group I accidents be reported not only to the commanding officer of the owning command but also to the Commanding General of the Army Air Forces, General Henry “Hap” Arnold.<sup>826</sup> Accidents in Groups II and III did not require a preliminary report to be forwarded to Headquarters Army Air Forces.<sup>827</sup> Nonetheless, based on the criteria for Group I accidents, most accidents were reported directly to General Arnold. In addition, the regulation stipulated that for

---

<sup>823</sup> A Brief History of Gunter Air Force Station, 25.

<sup>824</sup> Ibid., 38.

<sup>825</sup> War Department. *AAF Regulation no. 16-14 Reporting and Investigation of Aircraft Accidents*. Washington DC: Headquarters Army Air Forces, May 26, 1942.

<sup>826</sup> Ibid.

<sup>827</sup> Ibid.

Group I accidents a committee of three of the most experienced pilots in the command would be appointed to investigate the accident.<sup>828</sup> For incidents in Groups II and III, only one officer would be appointed to investigate the accident.<sup>829</sup> In May 1943, an intelligence officer was added to the team to assess if sabotage may have been involved. By 1945, the Army Air Force had formalized the investigative process to the extent that medical officers were part of the investigating team in order to assess physiological issues. It was at this same time that the Army Air Force Medical Office began publishing its own bulletin to acquaint medical officers with accident investigations.<sup>830</sup>

During the first half of 1945, accidents in the Army Air Forces were divided into the following categories: landing, in-flight, taxiing, takeoff, and parked. Forty-one percent of accidents during this period occurred during landing, 35 percent in-flight, 12 percent while taxiing, 10 percent during takeoff, and 2 percent while the aircraft was parked. The Army Air Forces further subdivided these categories into types of accidents. For example, the category “landings,” which had the highest percentage of accidents, was broken down as follows: 31 percent of landing accidents were “ground loops,” 18 percent were the result of a “wheels-up landing,” 9 percent “spins and stalls,” 8 percent due to a “hard landing,” 7 percent “inadvertent gear retraction,” 7 percent “under or over shooting the runway,” 7 percent from “collisions,” 6 percent “nose-ups or nose-overs,” and 7 percent resulted from the nebulous “other.”<sup>831</sup>

In-flight accidents formed the next largest category of accidents within the Army Air Forces. During the first half of 1945, 31 percent of in-flight accidents were the result of a “forced

---

<sup>828</sup> Ibid.

<sup>829</sup> Ibid.

<sup>830</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, 1.

<sup>831</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 36.

landing;” 24 percent were due to “collisions with mountains, trees, and wires;” 11 percent were caused by “fire or explosion;” 7 percent were from “spins or stalls;” 6 percent came when the crew abandoned their aircraft; 4 percent were from “collisions between aircraft not in formation;” and a rather high 15 percent were listed as “other.”<sup>832</sup> The last category was indicative of the number of aircraft that were lost to unknown causes.

The last three categories — taxiing, takeoff, and parked — comprised nearly one quarter of the accidents in the Army Air Force during the first half of 1945. Within these categories, collisions, ground loops, and “incomplete take-off” made up the preponderance of the causes.<sup>833</sup> Even though these statistics represent one six-month period, they all remained consistent throughout the war.

Within these groups, the Office of Flying Safety divided accidents into four broad categories: personnel error, material failure, miscellaneous, and undetermined.<sup>834</sup> During the first half of 1945, the Army Air Forces reported the following factors that contributed to accidents: Some 55 percent were caused by “pilot error,” 13 percent “other personnel errors,” 17 percent “material failure,” and 14 percent “miscellaneous factors.”<sup>835</sup> There were many reasons for these accidents such as pilot error, instructor error, violation of regulations, and mechanical error. The 1943 *Accident Facts* book noted that landings consistently led in the category “nature of accidents,” citing that nearly 48 percent of accidents in the first half of fiscal 1943 occurred during landing; by comparison, the rate for 1945 was 41 percent.<sup>836</sup> The report also noted that

---

<sup>832</sup> Ibid., 36.

<sup>833</sup> Ibid., 36

<sup>834</sup> War Department Bureau of Public Relations, Press Branch, 1 April 1943.

<sup>835</sup> Ibid., 36.

<sup>836</sup> United States Army Air Forces, *Accident Facts: U.S Army Air Forces*, 3.

this rate had been relatively constant since 1930.<sup>837</sup> In early 1944, the *New York Times* reported that the most frequent kind of fatal accident was “collision in full flight with mountains, trees, telephone poles and other stationary objects.”<sup>838</sup> However, a postwar study determined that spins and stalls accounted for the most fatalities.<sup>839</sup>

During the first half of 1944, over 1,100 accidents were attributed to instructor error.<sup>840</sup> The Army Air Force considered this to be inevitable given “the size of the AAF training program and the premium on speedy output of pilots....”<sup>841</sup> The Army Air Forces attributed instructor error to two causes: “First was the impossibility of always selecting as instructors those most fit to provide adequate instruction; and second was the difficulty of establishing a uniform and adequate course of instruction which would be universally applied.”<sup>842</sup> In addition, in some cases the instructors were charged with permitting students to commit unsafe acts or not intervening quickly enough to prevent an accident.<sup>843</sup> In many cases, the instructors themselves set the tone for acceptable behavior in the air. Instructors were known to play chicken with trains at crossings or to go “hot-dogging” over the houses of girlfriends.<sup>844</sup> In addition, in some cases the instructor was not much better trained in the aircraft being flown than were the cadets. One cadet recalled that his advanced flight-training instructor had exactly four hours more time in the

---

<sup>837</sup> Ibid., 3.

<sup>838</sup> *New York Times*, 16 January 1944.

<sup>839</sup> Ibid., 3.

<sup>840</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 36.

<sup>841</sup> Ibid., 36.

<sup>842</sup> Ibid., 36.

<sup>843</sup> Ibid., 21.

<sup>844</sup> Stephen G. Craft, *Embry-Riddle at War: Aviation Training during World War II* (Gainesville FL: University Press of Florida, 2009), 171.

AT-17 twin-engine trainer than his students.<sup>845</sup> He further stated that the instructor in this instance, besides being a bad instructor, was also afraid of the plane and could not fly it very well.<sup>846</sup>

In the first half of 1944, lack of proficiency in the model flown was found to be the cause of over 2,000 accidents. In addition, the Army Air Forces found that 37 percent of pilot error accidents in cargo aircraft involved pilots with fewer than ten hours of flying time in the aircraft.<sup>847</sup> In September 1944, there were 236 violations of regulations; these violations led to 70 accidents resulting in eleven fatalities.<sup>848</sup> During a six-month period, 553 accidents were attributed to airport conditions.<sup>849</sup> Collisions with other aircraft, other types of vehicles, and other airport equipment were the leading cause of these accidents.<sup>850</sup> Next came taxiing accidents many of which were attributed to “confusion at airports.”<sup>851</sup> Looking to the future, a 1946 Medical Section Safety Bulletin hinted that shortcuts in control tower operations may have been acceptable under wartime conditions but should not be condoned in peacetime.<sup>852</sup>

Over 2,700 accidents during the war were attributed to bad weather conditions.<sup>853</sup> A postwar Army Air Forces report found that during the first seven months of 1944 one out of every five fatalities, for a total of 632, occurred on an extended flight.<sup>854</sup> The leading cause was

---

<sup>845</sup> Watry, *Washout!: The Aviation Cadet Story*, 113.

<sup>846</sup> *Ibid.*, 113.

<sup>847</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 48, 37.

<sup>848</sup> *Ibid.*, 38.

<sup>849</sup> *Ibid.*, 41.

<sup>850</sup> *Ibid.*, 41.

<sup>851</sup> *Ibid.*, 41.

<sup>852</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, Vol. 3 (Washington DC: United States Army Air Forces, 1946), 3.

<sup>853</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 42.

<sup>854</sup> *Ibid.*, 43

flying into or being caught by bad weather followed by poor navigation.<sup>855</sup> The report went on to state that between January and May 1944 an average of 50 accidents per month were the result of the pilot “getting lost.”<sup>856</sup> Not surprisingly, the Army Air Forces reported that the accident rate for night flying was two to four times greater than during the day.<sup>857</sup> A combination of the two could be deadly on a training flight. For example, a training flight composed of 34 Royal Air Force (RAF) students and nine American instructors ran into bad weather during the return leg of a night cross-country flight. That night, twelve planes out of 35 crashed resulting in the death of seven student pilots.<sup>858</sup> In another, more poignant, example, one unfortunate pilot became lost on a night navigation training flight. The pilot eventually identified an airfield and after landing discovered he was only 40 miles from his home field. At 0245, the pilot and his gunner took off again; they were expected back at their base by 0330. The accident report ends with the simple yet haunting sentence, “The airplane was never heard from again.”<sup>859</sup>

Almost from its inception, the Air Force placed the majority of the blame for accidents on the pilots. In 1974, retired Air Force General Noel Parrish recalled that the Air Corps of the 1930s was a dangerous place. In an interview as part of the Air Force’s Oral History program, General Parrish told Air Force historian Dr. James C. Hasdorff that fifteen of the 96 members of his advanced flight training class died in accidents within a year of graduation.<sup>860</sup> These were

---

<sup>855</sup> Ibid., 43.

<sup>856</sup> Ibid., 43-44.

<sup>857</sup> Ibid., 44.

<sup>858</sup> Jerome A. Ennels, *A Brief History of Gunter Air Force Station: 1940-1980*. (Office of History, Headquarters Air University, Maxwell AFB AL, 1981), 37-38.

<sup>859</sup> Anthony J. Mireles, *Fatal Army Air Forces Aviation Accidents in the United States, 1941-1945* (Jefferson NC: McFarland, 2006), 349.

<sup>860</sup> Major General Noel F. Parrish, interview by James C. Hasdorff, (United States Air Force Oral History Program, 10-14 June 1974), 34.

“[m]ostly from pilot error.”<sup>861</sup> In *Global Mission*, Arnold recalled that after every crash, despite the sometimes-crude state of early aviation technology, it was “seldom the plane, or an unknown quantity in the air, but almost always the pilot, who was blamed for being in error.”<sup>862</sup> However, in another book, *This Flying Game*, Arnold had stated: “Hazard in the air will always be primarily due to pilotage errors; conversely, safety aloft must be placed to the credit of pilot skill.”<sup>863</sup> On 24 April 1942, the chief of the Office of Flying Safety reported to the *New York Times* that “Human failure is the basic problem.”<sup>864</sup> He added that fewer than 14 percent of accidents were the result of mechanical failure.”<sup>865</sup>

Even later, when technology was more advanced, the pilot was “almost always” the cause. In early 1942, the Office of Flying Safety reported: “Analysis of aircraft accidents during the past twelve years shows that on the average 69 percent of all accidents are due to personnel error and that 64 percent of all accidents are due to pilot error. These percentages have been increasing. In the fiscal year 1941, the percentages were 80 and 75, respectively.”<sup>866</sup> A 1943 report concluded, in spite of evidence to the contrary, that, even in cases where mechanical failure was the cause, “. . .it might be surmised that often the maintenance personnel may not be fulfilling their duties properly, but since the pilot should be able to land in spite of the engine failure, he is charged with the blame.”<sup>867</sup>

---

<sup>861</sup> *Ibid.*, 34.

<sup>862</sup> Henry Harley Arnold, *Global Mission* (Blue Ridge Summit PA: Tab Books, 1989), 20.

<sup>863</sup> Henry Harley Arnold and Ira Clarence Eaker, *This Flying Game*, 3d, ed. (New York, London: Funk & Wagnalls Company, 1943), 101.

<sup>864</sup> *New York Times*, 24 April 1942.

<sup>865</sup> *Ibid.*

<sup>866</sup> Memorandum on the “Machine Tabulation of First Pilot Flying Time by Airplane Type and Model” prepared by Colonel S. R. Harris, Director of Flying Safety 1942.

<sup>867</sup> United States Army Air Forces, *Accident Facts: U.S Army Air Forces*, 54.

However, over the course of the war, the rate, as reported, showed a downward trend. A January 1944 *New York Times* article noted that 48 percent of all fatal accidents were the result of personnel error, a number that was supported by the 1<sup>st</sup> Air Force in 1945.<sup>868</sup> The 1<sup>st</sup> Air Force's June 1945 Safety Bulletin stated that pilot error accounted for 50 percent of all accidents and four fatalities for the month of May.<sup>869</sup> Nonetheless, between 1940 and the first half of 1945, the Army Air Forces attributed 39,000 or 75 percent of all accidents to pilot error.<sup>870</sup> In August 1942 a new section was added to the Directorate of Flying Safety to address the increasing number of accidents attributed to pilot error; it was called Educational Projects.<sup>871</sup> For the first time the Army Air Forces began investigating how to educate pilots about safety and accident prevention.<sup>872</sup>

A postwar study by the Army Air Forces separated pilot errors into the following categories: 19 percent misused power plant or flight controls; 15 percent failed to coordinate controls; 14 percent unfamiliar with aircraft or not proficient with instruments; 12 percent failed to see and avoid obstacles; 10 percent misused landing gear controls or brakes; 4 percent violated flying regulations; and 4 percent did not make adequate flight preparations.<sup>873</sup>

However, based on the accident reports and recollections of the pilots, the vast majority could have been attributed to the unstated category of "overconfidence." As noted previously, Arnold cautioned that there was a brief period in flight training when a cadet "becomes

---

<sup>868</sup> *New York Times*, 16 January 1944.

<sup>869</sup> 1st Air Force, *That You May Live: 1st Air Force Safety Bulletin*, 6.

<sup>870</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 35.

<sup>871</sup> United States Army Air Forces, *History of Flight Training Command, 1 July 1941-17 April 1943* (Washington DC: Headquarters, United States Army Air Forces, 1943), 5.

<sup>872</sup> *Ibid.*, 5.

<sup>873</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 48, 21.



overconfident and knows more about flying than he will ever know again.”<sup>874</sup> He considered this the most dangerous period in a pilot’s career.<sup>875</sup>

Pilot error was the cause of 86 percent of accidents during primary flight training and caused 63 percent of the fatalities.<sup>876</sup> In basic flight training, the percentage of accidents was slightly lower at 81 percent; however, 73 percent of fatalities were directly attributable to the pilot.<sup>877</sup> A 1943 report noted that the majority of accidents in advanced training could be attributed to “carelessness” on the part of the student pilots.<sup>878</sup> The report concluded: “It has been observed that in several cases, Advanced Flying School students seem to underestimate the hazards or to overestimate their ability.”<sup>879</sup> In an attempt to curb some of this enthusiasm, a 1943 report recommended that students be reminded that “Instructions and regulations are made by older, more experienced men for the sole purpose of making the students’ training complete and safe.”<sup>880</sup>

The official history for Randolph Field noted that “Pilots still tend to be overconfident and careless in the AT-6 [an advanced trainer], and practically all accidents are the result of pilot error.”<sup>881</sup> In one instance, a cadet, after his first solo flight in basic flight training, flew back to his primary flight-training airfield to show off for his old instructor. He was killed due to a high-

---

<sup>874</sup> Arnold and Eaker, *This Flying Game*, 101.

<sup>875</sup> *Ibid.*, 101.

<sup>876</sup> United States Army Air Forces, *Accident Facts: U.S Army Air Forces*, 12.

<sup>877</sup> *Ibid.*, 12.

<sup>878</sup> *Ibid.*, 46.

<sup>879</sup> *Ibid.*, 46.

<sup>880</sup> *Ibid.*, 30.

<sup>881</sup> United States Army Air Forces, *History of the Army Air Forces Pilot School (Specialized VHB) Randolph Field, Texas, Eighth Bimonthly Supplement, 1 May 1945-1 July 1945*, 215.

speed stall.<sup>882</sup> Another cadet, Phillip Ardery, recalled returning from a ferry flight and the pilots putting on their customary “rat race,” performing various maneuvers over the field before landing.<sup>883</sup> In another instance, he recalled a “rat race” with a fellow pilot. “It was a sort of follow-the-leader with each trying to outdo each other.”<sup>884</sup> However, he did claim that, in spite of the risk, “This flying was great training for us....”<sup>885</sup> General Parrish summed it best in a postwar interview when he recalled:

Crashes — mostly pilot error, and most of it was from high-spirited behavior. We, of course, had no radios in the planes, and people would take chances on weather.... Doing stunts, flying under things, flying low, especially, and pulling up. Most of us had no strong desire to get up where it was terribly lonesome and fly around, other than to do a little acrobatics, but to get down low where people could see us, because we attracted an awful lot of attention. Everybody came out to watch....This was too much temptation and led to a few crashes of people doing stunts, pulling out, flying low, and pulling steep climbs, and things of that sort — doing acrobatics at low altitudes. Some of it was engine failure, things of that sort would cause it, but it was a very risky life.<sup>886</sup>

While the crash of a ten-place bomber had the potential for more fatalities than the crash of a single-seat fighter, it was fighter pilots in training who suffered a higher rate of fatalities. With

---

<sup>882</sup> Marvin L. Skelton, *Memoirs of a World War II Pilot* (Manhattan KS: Military Affairs/Aerospace Historian, 1978), 73.

<sup>883</sup> Philip Ardery, *Bomber Pilot: A Memoir of World War II* (Lexington KY: University Press of Kentucky, 1978), 33.

<sup>884</sup> *Ibid.*, 33.

<sup>885</sup> *Ibid.*, 33.

<sup>886</sup> Noel F. Parrish, interview by James C. Hasdorff, (United States Air Force Oral History Program, 10-14 June 1974), 34

an emphasis on acrobatics and risk taking, the rate for these pilots was 70 for every 100,000 flight hours.<sup>887</sup>

The accidents of foreign nationals in Army Air Forces flight training were assigned to the same categories, as noted before, as for American cadets. Even though they were tracked and reported separately, their numbers were rolled up in the final tabulations for the Army Air Forces. The official history of foreign pilot training notes that British cadets “were notorious for their indifference to American flying regulations.”<sup>888</sup> For example, “The students buzzed highways at low altitude, causing car wrecks; flew under bridges; dog-fought [sic] above the town; and took great delight in bouncing their planes in front of vehicles on the highways.”<sup>889</sup> The history failed to mention that American cadets were partial to the same stunts. In addition, according to the official history, “they [the British cadets] had even developed the notion that it was smart [meaning it was a badge of honor] to walk away from an accident, and at one time eighteen planes were wrecked at one airfield in the space of four days.”<sup>890</sup>

During 1942, at Gunter Army Air Field in Alabama, 20 British students were killed while only five Americans died in training.<sup>891</sup> Another field reported that it did not have any training accidents until the British arrived, and then it had sixteen, eleven involving British students.<sup>892</sup> The airfield personnel did not explicitly claim that there was a correlation. However, the *History*

---

<sup>887</sup> Cameron, *Training to Fly: Military Flight Training, 1907-1945*, 403.

<sup>888</sup> Jay E. Hines, *History of Foreign Training in ATC, 1941-1976* (Randolph AFB, TX: History and Research Division, Office of the Chief of Staff, 13.

<sup>889</sup> *Ibid.*, 13.

<sup>890</sup> *Ibid.*, 13.

<sup>891</sup> Jerome A. Ennels. *A Brief History of Gunter Air Force Station: 1940-1980*. (Office of History, Headquarters Air University, Maxwell AFB AL, 1981), 37.

<sup>892</sup> Jay E. Hines, *History of Foreign Training in ATC, 1941-1976* (Randolph AFB, TX: History and Research Division, Office of the Chief of Staff, 13.

*of Foreign Training in ATC, 1941–1976*, in a bit of national chauvinism, attributed the British accidents to the fact that

...most of the British students were unaccustomed to driving automobiles and did not have mechanical toys as children. Consequently, it was believed, they were lacking in mechanical aptitude. Poor eyesight was also blamed, because the RAF's standards of visual acuity were lower than those of the Army Air Corps.<sup>893</sup>

Several of the accidents and fatalities suffered by French cadets were due to a change in the program of instruction requested by their air force. In December 1944, based on reports from the field, “on-the-deck” flying was added to the training regimen.<sup>894</sup> The cadet was required to fly below fifty feet in simulated strafing runs. While there were not any serious injuries during this training, there were numerous accidents, enough that “it was thought prudent to do away with flying under fifty feet to eliminate further accidents at this height.”<sup>895</sup> The program of instruction was eventually modified to have the “cadet reduce his altitude to fifty feet over a period of flights.”<sup>896</sup>

Even instructors were not immune to “pilot error.” In a postwar interview, Major General David V. Miller recalled the time when, as an instructor, he landed with his wheels up. In the interview, he pointed out that the landing gear warning horn was sounding, but he

---

<sup>893</sup> Ibid., 13.

<sup>894</sup> Ibid., 18.

<sup>895</sup> Ibid., 18.

<sup>896</sup> Ibid., 18.

absentmindedly switched it off because it was “making too much noise.”<sup>897</sup> After touching down and before realizing his mistake, General Miller recalled thinking to himself, “this field is sure rough since the last time I landed.”<sup>898</sup> He said he owned up to his mistake and reported it as “100% pilot error.”<sup>899</sup> Miller also concluded that many accidents, especially in more complex twin-engine aircraft, were the result of the Air Corps’ lack of familiarity with that type of aircraft.<sup>900</sup>

A postwar study by the Office of the Air Surgeon admitted that some accidents that had been attributed to “pilot error” were sometimes due to poor design or poor layout of controls.<sup>901</sup> This was also sometimes categorized as “misuse of controls.” Misuse of controls covered a wide variety of errors from confusing switches to failing to switch fuel tanks.<sup>902</sup> For instance, confusing the flap and landing gear switches accounted for 457 accidents during a 20-month period of the war.<sup>903</sup> In one aircraft, the AT-10 twin-engine trainer, confusing the flap and landing gear switches was the cause of 78 accidents in early 1943.<sup>904</sup> Later that same year, the switches were modified and relocated in the cockpit; that relatively simple change was credited with reducing the accident rate in the AT-10 to seven for the remainder of the year.<sup>905</sup>

---

<sup>897</sup> Major General David V. Miller, interview by James C. Hasdorff, (United States Air Force Oral History Program, 25 September 1985), 16-17.

<sup>898</sup> *Ibid.*, 16-17.

<sup>899</sup> *Ibid.*, 16-17.

<sup>900</sup> *Ibid.*, 16-17.

<sup>901</sup> United States Army Air Forces Office of the Air Surgeon, *Stanines: Selection and Classification for Air Crew Duty* (Washington DC: US GPO, 1946), 46.

<sup>902</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 21.

<sup>903</sup> *Ibid.*, 27.

<sup>904</sup> *Ibid.*, 29.

<sup>905</sup> *Ibid.*, 29.

The operation of the fuel selector valve was blamed for several accidents in basic flight training. The investigating officer recommended that the Air Corps should determine if a better-designed selector valve was available.<sup>906</sup> The same report suggested that a review of the layout of controls should be conducted on all aircraft in the Army Air Forces.<sup>907</sup> The report concluded: “A pilot becomes accustomed to reaching for a lever in a particular place; then he changes the type of plane and has difficulty.”<sup>908</sup> For example, Charles Watry in his memoirs described a potentially dangerous situation he put himself and his crew in through his own error. He was on his fourth flight in a B-25 during advanced training. When the instructor called for an adjustment in the controls, Watry reached for the controls where they would have been on his previous aircraft. Unfortunately, the arrangement on the controls of B-25 was not the same — in fact, it was the opposite — and Watry’s actions almost shut off the fuel to the engines. Even though the controls were the same color in both aircraft, the positioning was different. Watry admitted he “had acted from habit not from logic.”<sup>909</sup>

Another category created by the Army Air Forces was “Other Personnel Error.” This category was a catch-all for errors by “maintenance personnel, crew members, flying instructors, supervisory personnel, etc.”<sup>910</sup> It was noted in the *Accident Bulletin for Medical Investigators* issue for February 1945 that this category accounted for one-fifth of all accidents in the last

---

<sup>906</sup> United States Army Air Forces, *Accident Facts: U.S Army Air Forces*, (Winston-Salem NC: The Flight Control Command, 1943), 30.

<sup>907</sup> *Ibid.*, 30.

<sup>908</sup> *Ibid.*, 30.

<sup>909</sup> Watry, *Washout!: The Aviation Cadet Story*, 127.

<sup>910</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, Feb ed. Vol. 2. (Washington DC: United States Army Air Forces, 1945), 3.

quarter of 1944.<sup>911</sup> In October 1944 alone, two accidents a day were attributed to this category.<sup>912</sup> Other personnel errors were broken down into the following categories: 36 percent supervisory; 20 maintenance; 17 percent instructor; 17 percent crewmembers; and 10 percent and an undefined “other.”

Supervisory personnel included tower personnel and anyone involved with approving flights. Therefore, this category includes dispatching aircraft in less than optimal conditions, failing to mark obstacles on the field, incorrect weather forecasts, and inadequate directions from the tower.<sup>913</sup> For example, Major General Miller recalled an incident in which in the name of efficiency the base commander established two control towers, one for each squadron. The experiment lasted long enough for two planes, on night flight training, to collide.<sup>914</sup> In recounting more of the “beno” rules at his airfield, Charles Watry noted that one of the rules was “there would ‘beno’ sleeping on the flight line.”<sup>915</sup> Watry recalled that the stress of flight training and lack of sleep were causing pilot errors.<sup>916</sup> He said that this rule stayed in effect until the flight surgeon ordered cots to be placed in the ready room so that cadets could sleep on them between flights.<sup>917</sup> It was reported in 1943 that many accidents attributed to weather were actually the result of pilots being cleared for an instrument flight without the supervisory personnel certifying that the pilot was properly trained for instrument flying.<sup>918</sup> Another

---

<sup>911</sup> Ibid., 3-4.

<sup>912</sup> Ibid.

<sup>913</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 21.

<sup>914</sup> Major General David V. Miller, interview by James C. Hasdorff, (United States Air Force Oral History Program, 25 September 1985), 16-17.

<sup>915</sup> Watry, *Washout!: The Aviation Cadet Story*, 132.

<sup>916</sup> Ibid., 132.

<sup>917</sup> Ibid., 132.

<sup>918</sup> *History of the Army Air Forces Office of Flying Safety*, December 1943, 55.

instance of increased supervision came in early 1945 when the commander of Air Training Command informed one of his subordinate commanders that the Army Air Forces had recently suffered seventeen accidents, that ten of those were attributable to weather conditions, and that all ten of those accidents were fatal.<sup>919</sup> He wanted to emphasize that even though winter was upon them, the answer to accident prevention was not the curtailment of activities but “better supervision during the flight planning process.”<sup>920</sup>

Maintenance errors ran the gamut from installing the improper part or installing the right part improperly, to leaving tools and other objects in the aircraft.<sup>921</sup> However, it must be kept in mind that the number of maintenance personnel was expanding as rapidly as the aircrews, so there were bound to be some inadequately trained maintenance personnel. At other times, it could be a combination of supervisory and maintenance errors. For example, a report from the Air Staff to the Commanding General, Air Training Command was the culmination of an eight-month investigation into the cause of a fatal crash of a C-54 transport airplane. The investigation found that improper maintenance practices, such as a locally fabricated gasket and overlooking frayed cables, contributed to the crash. In addition to the maintenance issues, it was discovered that on 64 flights the aircraft had been operated on “red diagonal.” This meant that it was known that the aircraft had mechanical problems, but an officer in the chain of command, usually the executive officer, authorized the aircraft for use.<sup>922</sup>

---

<sup>919</sup> Memorandum from Commander Air Training Command to Commander Pacific Division, Air Training Command, 1 Jan 1945.

<sup>920</sup> Ibid.

<sup>921</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 21.

<sup>922</sup> Memorandum from Deputy Chief of Air Staff to Commanding General Air Training Command, Subject: Aircraft Accident involving C-54A42-72252, 11 Nov 1944, 3 July 1945.



Many accidents were attributed to two groups the Army Air Forces was reluctant to discuss. Pilots returning from combat assignments formed the first group, and those with a “fear of flying” made up the second. In 1943, Lieutenant W. F. Dougherty of the Air Staff sent an embarrassing memorandum to Lieutenant W. S. Griswold of the Army Air Forces Historical Office concerning returning pilots. In the memorandum, Dougherty noted that Lieutenant Colonel E. N. Townsend, the commander of Region Ten, reported that many pilots with combat experience were not qualified to fly cross-country navigation flights because, “When flying combat missions, they follow the leader or depend on their navigator.”<sup>923</sup> The same document recommended that flight surgeons spend more time with returning pilots in order to assess their mental state. As the memorandum noted, “One interview is not sufficient for psychoanalysis, and it is evident that the daring and cockiness instilled in combat pilots lingers after return to the continental limits of the United States, and it is something that should not be removed by quick extraction.”<sup>924</sup> In addition, in August 1945, the Office of Flying Safety requested that supervisors take a more active role in accident prevention, especially for returning combat pilots and those awaiting reassignment. They were exhorted to enforce “air discipline to eliminate needless accidents resulting from flagrant violations of flying regulations.”<sup>925</sup> The problem became more acute after the war and the Army Air Forces Safety Council noted its concern over the increased accident rate among experienced pilots returning from overseas.<sup>926</sup> The Council suggested that returning pilots were having a difficult time transitioning to lighter aircraft after

---

<sup>923</sup> Memorandum on the “Classification and Assignment of Pilots Returning from Combat,” 22 Dec 1943.

<sup>924</sup> Ibid.

<sup>925</sup> Memorandum from Office of Flying Standards to all Training Commands, 30 Aug 1945.

<sup>926</sup> Safety Council Minutes, 7 December 1945. The safety officers of each subordinate command would meet monthly to discuss safety issues in the Army Air Forces.

flying heavier combat aircraft.<sup>927</sup> The rise in the accident rate was also attributed to the loss of maintenance personnel and supervisors in flying schools due to demobilization.<sup>928</sup> The last cause cited by the Council was pilots taking a “farewell” flight before leaving the service.<sup>929</sup> According to the Safety Council, the best solution to this last problem was to remove pilots from flight status as they approached the date of their discharge from the Army.<sup>930</sup>

The other category was more sensitive for the Army Air Forces to address. For obvious reasons, the Army Air Forces considered “fear of flying,” also referred to as “lack of incentive for flying,” as the most “vexing and harassing” of all grounds for dismissals.<sup>931</sup> In the first nine months of 1944, the Army Air Forces averaged fewer than 20 discharges for “fear of flying”; however, the number rose to 63 in October 1944. The Army Air Forces believed the rise was due to a change in the regulations making the separation of inferior pilots easier so that units were no longer reassigning officers with a “lack of incentive for flying” to administrative duties.<sup>932</sup> Officers so categorized, but who were of “mature judgment and extensive service,” could be retained because it was assumed that these officers could still contribute in non-flying assignments.<sup>933</sup> For example, based on problems in finding suitable pilots and crews for the B-29 program, the commander of 2<sup>nd</sup> Air Force, who was responsible for preparing the first B-29 group for combat, suggested that it would be beneficial to remove more senior officers from flight status who were no longer useful to the Army Air Forces as pilots. However, he also

---

<sup>927</sup> Ibid.

<sup>928</sup> Ibid.

<sup>929</sup> Ibid.

<sup>930</sup> Ibid.

<sup>931</sup> US Air Force Historical Division, *US Air Force Historical Study no 11: Personnel Problems Relating to AAF Commissioned Officers, 1939-1945* (Maxwell AFB AL: USAF Historical Division, 1951), 142.

<sup>932</sup> Ibid., 142.

<sup>933</sup> Ibid., 142.

recommended that they should be released “with a ‘pat on the back’ for a job ‘well done.’”<sup>934</sup>

On the other hand, newer officers were a different matter. The official history stated that “young officers who had been trained and commissioned for the sole purpose of flying were of value only in that role; if they refused to perform it, they were to be eliminated from the AAF.”<sup>935</sup> The training regimen was not perfect, and sometimes cadets made it through who were not very good pilots. In those cases, the officers were offered to Army Ground Forces (AGF).<sup>936</sup>

Nonetheless, the results, in the long term, reaffirmed the Army Air Forces’ selection procedures. The Army Air Forces conducted a study of 9,000 cadets in the 2<sup>nd</sup> Air Force to determine the correlation between stanine scores and accidents. The study found that the lower the stanine score the greater the chance of the pilot being involved in a “pilot error” accident.<sup>937</sup> As a postwar safety study stated: “. . . while a large proportion of all aircraft accidents can be traced to the pilot as the immediate cause, avoidance of these errors often depends upon improvements in the aircraft rather than the pilot.”<sup>938</sup> Throughout the war, material failure was the primary contributing factor in more than 13,000 accidents. The following categories made up the majority of these accidents: 5,500 power plant failures, 4,400 landing gear failure, and over 1,000 to airframe failures.<sup>939</sup>

A 1944 *New York Times* article noted: “The safest plane is the primary trainer and the most dangerous is the fighter, with the light bomber, the medium and heavy bombers following

---

<sup>934</sup> Memorandum from Major General Robert B. Williams, Commander 2nd Air Force to Commanding General, Army Air Forces, 15 Feb 1945.

<sup>935</sup> US Air Force Historical Division, *US Air Force Historical Study no 11: Personnel Problems Relating to AAF Commissioned Officers, 1939-1945* (Maxwell AFB AL: USAF Historical Division, 1951), 143-144.

<sup>936</sup> *Ibid.*, 149.

<sup>937</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 36.

<sup>938</sup> *Ibid.*, 27.

<sup>939</sup> *Ibid.*, 30.

in that order.”<sup>940</sup> The article went on: “The fatality rate in flying training alone is about the same as before the war but it is during combat training that the rate rises.”<sup>941</sup> A postwar study noted: “The design of military aircraft has been predicated on many factors other than safety.”<sup>942</sup> Safety considerations were limited to such things as “wing loading, adequate power, protective armor, or seat belts.”<sup>943</sup> In late 1942, Lieutenant General George Brett, one of the pioneers of the Army Air Forces, told the *New York Times* that the Army Air Forces was not going to build “freak airplanes.” He was referring to his own assumption and that of many other leaders in the Army Air Forces that Axis aircraft designers were “willing to risk their pilots’ lives to enhance performance, an assumption that was wrong.”<sup>944</sup> Nonetheless, General Brett added, as reported in the *New York Times*:

“We aren’t going to sacrifice a single item essential to safety in order to save weight,” he added, “We aren’t going to sacrifice essential armament to gain another 500 feet of altitude. We’ll get that other ways. We aren’t going to eliminate leak-proof gasoline tanks or parachutes or any other form of protection.”<sup>945</sup>

However, there were instances when accidents resulted from design decisions. For example, numerous accidents were attributed to poor visibility out of the cockpit.<sup>946</sup> In another case, the *Accident Bulletin for Medical Officers* for February 1945 stated that the P-47 was noted for having its running lights built into the wing, making them difficult to see from behind,

---

<sup>940</sup> *New York Times*, 16 January 1944.

<sup>941</sup> *Ibid.*

<sup>942</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 30.

<sup>943</sup> *Ibid.*, 30-31.

<sup>944</sup> *New York Times*, 8 September 1942.

<sup>945</sup> *Ibid.*

<sup>946</sup> United States. Army Air Forces, *Accident Facts: U.S Army Air Forces*, 30.

leading to possible accidents.<sup>947</sup> One cadet, Charles Watry, blamed the training program and the aircraft itself for his slow progress in learning how to fly the B-25 Mitchell medium bomber. He recalled that cadets were not allowed to conduct “touch-and-go” landings but had to taxi back to the end of the runway to take off again. The cadet then had to fly around for 30 minutes to let the brakes cool off before he could practice another landing.<sup>948</sup>

Some airplanes acquired a bad reputation because of design flaws or flight characteristics. As Arnold noted in his postwar memoir, “In my long experience with airmen and airplanes, I have learned that if the flyers themselves come to genuinely believe that a certain plane is a “‘Flying Coffin’ or a ‘Man Killer,’ then it is definitely a ‘Flying Coffin’ or a ‘Man Killer’ until they have been convinced otherwise.”<sup>949</sup> Other names crews gave to the planes were of a lighter nature. For instance, Charles Watry mentioned some his fellow pilots’ names for the AT-17 Bobcat twin-engine trainer, such as “Bamboo Bomber” or “Termites Delight,” which highlighted the plane’s wooden construction.<sup>950</sup>

In his memoir *Global Mission*, Arnold discussed dealing with perception and reality when it came to aircraft. During World War One, the DH-4 was called the “Flying Coffin” by the crews because the fuel tank was located between the pilot and observer.<sup>951</sup> After the fuel tank was moved, the crews felt more secure and the name was dropped. Arnold stated that he had observed the same phenomenon during World War Two concerning the B-26 Marauder, a twin-engine medium bomber, and the P-38 Lightning, a twin-engine single-seat fighter. For example, in the first six months of 1944 over 25 of all P-38 accidents were fatal, while the other four

---

<sup>947</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, 3.

<sup>948</sup> Watry, *Washout!: The Aviation Cadet Story*, 128.

<sup>949</sup> Arnold, *Global Mission*, 67.

<sup>950</sup> Watry, *Washout!: The Aviation Cadet Story*, 113.

<sup>951</sup> Arnold, *Global Mission*, 67.

primary fighter types averaged fewer than thirteen fatal accidents all combined.<sup>952</sup> The P-38 also illustrates the tradeoff between safety and performance. The Safety Office recommended that fire extinguishers be fitted to P-38 engines in order to reduce accidents due to engine fires.<sup>953</sup> The Material and Services Division countered that recommendation by pointing out that the P-38 was already overloaded and the extinguishers would increase the weight by 58 pounds, which would hinder the overall performance of the aircraft.<sup>954</sup> The Material Division assured General Arnold that it was pursuing other means to reduce engine fires.<sup>955</sup>

In the case of the B-26, the Army Air Force's Safety Board concluded that the primary problem with the B-26 was inexperienced air and ground crews plus the increased weight of the aircraft to meet combat conditions without an increase in power.<sup>956</sup> In due course, it gained a reputation not only as a "Man Killer" but also as a maintenance problem. At one point, in 1943, the maintenance problems with the B-26 were so severe that at one school there were only nine aircraft for 92 students.<sup>957</sup> In another instance, the demand for pilots forced the graduation of one class after only one solo flight.<sup>958</sup> Because of its reputation as a deadly airplane, emergency procedures received more emphasis in transition training for the B-26 than any other aircraft during the war.<sup>959</sup>

---

<sup>952</sup> Memorandum for Brigadier General Kenneth C. Royall, Special Assistant to the Secretary of War, Subject: Hood Committee Investigation – P40 and C46 Foreign Accidents, 31 July 1945.

<sup>953</sup> Memorandum from Executive Officer Material and Services Division to Chief of Air Staff, March 1945.

<sup>954</sup> *Ibid.*

<sup>955</sup> *Ibid.*

<sup>956</sup> Robert Jackson, *Infamous Aircraft: Dangerous Designs and their Vices* (Barnsley, U.K.: Pen & Sword Aviation, 2005), 61.

<sup>957</sup> United States Army Air Forces, *Army Air Forces Historical Study, no 18: Pilot Transition to Combat Aircraft* (Maxwell AFB AL: United States Army Air Forces Historical Division, 1944), 194.

<sup>958</sup> *Ibid.*, 172.

<sup>959</sup> *Ibid.*, 81.

In 1942, Congress was on the verge of cancelling production of the B-26 because of the number of accidents in training whereas the crews flying them in combat campaigned to keep it in production.<sup>960</sup> The Army Air Forces took further measures in 1943 to rehabilitate the reputation of the B-26 by sending combat experienced crews to the training bases to give lectures and demonstrations on the capabilities of the aircraft.<sup>961</sup> Over time these visits improved morale and enhanced the cadets confidence in the B-26; in fact, at one base after one of these visits, one third of the class volunteered for B-26 training.<sup>962</sup> Nevertheless, the B-26 never completely shed its image as a dangerous plane. For instance, in late 1943, WASP pilot Sara Chapin expressed hope that she would not “get” B-26s coming out of flight school. As she explained in a letter to her mother, “I don’t think I’m hot enuf [sic]—and there have bin [sic] too many accidents.”<sup>963</sup>

The two primary heavy bombers throughout the war, the B-17 Flying Fortress and the B-24 Liberator, accounted for 32 percent of the flight training fatalities in the Continental United States.<sup>964</sup> However, the B-24 was the deadlier of the two (Table 6). Between 1942 and 1943, the B-24 was the deadliest bomber during training. In 1943 alone, 850 men lost their lives in 298 accidents.<sup>965</sup> One group lost seven planes and 43 men in one six-week period.<sup>966</sup> At a 1943 training conference concerning the B-24, it was agreed that “the actual flying of a B-24 airplane,

---

<sup>960</sup> Jackson, *Infamous Aircraft: Dangerous Designs and their Vices*, 60.

<sup>961</sup> United States Army Air Forces, *Army Air Forces Historical Study, No 18: Pilot Transition to Combat Aircraft*, 90-91.

<sup>962</sup> *Ibid.*

<sup>963</sup> Sara Chapin, letter to mother, 10-21-43, WASP Letters 1943-1944, edited by Mary Caldera, (The Woman’s Collection, Texas Woman’s University, Denton TX, 1995).

<sup>964</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, 1.

<sup>965</sup> Martin W. Bowman, *The USAAF Handbook 1939-1945*, 1st ed. (Mechanicsburg PA: Stackpole Books, 1997), 237-239.

<sup>966</sup> *Ibid.*, 237-239.

by a young [new] pilot [because it was a more complex and demanding aircraft], was thirty percent more difficult than the flying of a B-17 airplane, as the B-17 was more conventional in design and operation and was more like what the young pilot had been accustomed to.<sup>967</sup>

Instrument training, in particular, was much easier to accomplish in a B-17 than in a B-24 airplane.”<sup>968</sup> Philip Ardery, a B-24 instructor, stated in his memoirs that a spate of crashes by B-24s was attributed [by the pilots] to “poorly rebuilt engines” and green pilots unfamiliar with emergency procedures.<sup>969</sup> He recalled that the result of these crashes was “near panic among the pilots.”<sup>970</sup>

After the B-26, the next most infamous airplane for accidents was the B-29 Superfortress. The B-29 represented a giant leap in technology and complexity for the Army Air Forces. In addition, a significant amount of financial and material resources had been diverted to the B-29 program; therefore, special steps were taken to insure the crews were properly trained. When it was introduced, it was deemed so advanced that the Army Air Forces established special requirements for assignment to that plane. For instance, priority was given to pilots with 1,000 hours of four-engine flying time.<sup>971</sup> In addition, according to the official history of combat crew training, accidents with the B-29 occurred so frequently that more instruction on bailout and

---

<sup>967</sup> The B-24 was a radical design for its time. It outperformed the B-17 in speed, range, and bomb load but it was difficult to fly. Partially this as due to its new wing design that allowed the plane to fly higher than the B-17 but it also required more control input. This flaw made it difficult for new pilots to maintain formation, a requirement for the Army Air Forces precision bombing doctrine.

<sup>968</sup> United States Army Air Forces, *Army Air Forces Historical Study, no 18: Pilot Transition to Combat Aircraft*, 148.

<sup>969</sup> Ardery, *Bomber Pilot: A Memoir of World War II*, 51.

<sup>970</sup> *Ibid.*, 51.

<sup>971</sup> United States Army Air Forces, *Army Air Forces Historical Study, No 18: Pilot Transition to Combat Aircraft*, 77.



ditching procedures was recommended along with reduced load limits during the initial training flights.<sup>972</sup>

Over time, the B-29 began gaining a reputation similar to that of the B-26 and began causing a similar concern among the senior leaders of the Army Air Forces. One example was a letter from Brigadier General Lauris Norstad, Chief of Staff of the first unit to be equipped with the B-29, to the Chief of Air Staff concerning the increasing number of B-29 accidents caused by engine fires. Norstad stated that at the current rate it would not be unforeseeable for the rate to be “something like one ‘accident’ per day.”<sup>973</sup> He gave no explanation for putting the word accident in quotation marks. However, General Norstad’s prediction was not far off the mark; between 1 September and 24 November 1944, the rate was nearly one accident every two days.<sup>974</sup> Engine fires continued to be a problem in the B-29 program. For example, in a letter to Deputy Commanding General and Chief of Staff Lieutenant General Barney Giles, Major General Robert B. Williams, the Commanding General 2<sup>nd</sup> Air Force, voiced his concern that the fear of engine fires in B-29s was causing crews to abort training flights over minor malfunctions.<sup>975</sup> The Army Air Forces’ response to this problem was similar to that taken with the B-26. However, there was a chauvinistic twist. One of the Army Air Forces’ most experienced pilots with the B-29, Colonel Paul Tibbets, was tasked to find a way to convince the men that the plane was safe. His solution was to train two WASP pilots to fly the B-29.<sup>976</sup> He chose Dora Dougherty and

---

<sup>972</sup> United States Army Air Forces, *Army Air Forces Historical Study No 61: Combat Crew and Unit Training in AAF, 1939-1945*, 32-33.

<sup>973</sup> Letter from Brigadier General Lauris Norstad to Chief of Air Staff, Subject: Fires in B-29 Aircraft, 26 Jan 1945.

<sup>974</sup> Memorandum from the Office of Flying Safety, Colonel George C. Price Chief of Flying Safety, 25 Nov 1944.

<sup>975</sup> Letter from Commanding General 2<sup>nd</sup> Air Force to Deputy Commanding General and Chief of Staff, 8 Jan 1945.

<sup>976</sup> General Paul Tibbets interview by Dawn Letson, Women Airforce Service Pilots Oral History Report, 24 February 1997, (The Woman’s Collection, Texas Women’s University, Denton TX, 2002).

Dorothea Johnson Moorman from a group of eight volunteers at Eglin Field, FL.<sup>977</sup> In a matter of days, Tibbets trained Dora as the pilot and Dorothea as co-pilot.<sup>978</sup> Not surprisingly, one of the plane's engines caught fire during the check ride but both followed the standard emergency procedures and safely landed the plane.<sup>979</sup> The next step in Tibbets' plan was to take the women around the B-29 airfields to put on demonstration flights to shame the men and show them that "even a woman" could fly the plane.<sup>980</sup>

On the other hand, at times, some short cuts were taken in order to get the plane into combat. For example, Major General Kenneth B. Wolfe, chief of the B-29 program, suggested combining testing and training to save time in the B-29 program. His recommendation was to take new crews and have them conduct the flight test of a plane just coming off the assembly line as they trained. Wolfe estimated that this change would save six months if a plane from the assembly line was matched up with a crew in transition training. Arnold approved this change and commended Wolfe for his recommendation in the annual report to the Secretary of War.<sup>981</sup>

In another instance, a memorandum dated 18 June 1945 from the Headquarters of Flying Training Command to the Commander of Randolph Field, where B-29 transition training was taking place, informed the commander that the training must conform to Army Air Force policies "as closely as possible. However, you are authorized to graduate [a] crew when the airplane commander has accomplished one day solo and one night solo flight and has a minimum of 15

---

<sup>977</sup> Ibid.

<sup>978</sup> Ibid.

<sup>979</sup> Ibid.

<sup>980</sup> Ibid.

<sup>981</sup> United States. Army Air Forces and Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War*, 390.

hours.”<sup>982</sup> The memorandum from Flying Training Command went on to add “In all instances the pilot, copilot, and flight engineer of the crew will receive as much ground training as possible,” leaving the definition of “as possible” open to interpretation.<sup>983</sup>

“Material failure” was another major category of accidents. In 1945, an Army Air Forces study revealed that nearly 40 percent of accidents during the previous six months were the result of material failure.<sup>984</sup> The Army Air Forces identified the following sub-categories under material failure: 45 percent power plant; 29 percent landing gear; 7 percent airframe; and 19 percent other.

Beginning in 1944, a disproportionate number of accidents began to occur with the AT-6 trainer. The Office of Flying Safety began a special investigation into the problem. It was eventually determined that the majority of accidents were attributable to a “material failure of the fuel system resulting in fire or explosion.” In early 1945, General Arnold became so concerned about fires in C-46 transport aircraft that he directed a special study be completed to find out why these fires were occurring.<sup>985</sup> The report concluded that, although 10 percent of C-46 accidents between September 1944 and February 1945 had been attributed to fire, a closer examination of the accident reports indicated that only 5 percent could be specifically attributed to it. The rest were the result of maintenance or mechanical failure.<sup>986</sup> In addition, in some cases, the “material failure” could be traced back to the manufacturer. In 1943, there was a scandal

---

<sup>982</sup> United States Army Air Forces, *History of the Army Air Forces Pilot School (Specialized VHB) Randolph Field, Texas, Eighth Bimonthly Supplement, 1 May 1945-1 July 1945*, 245.

<sup>983</sup> *Ibid.*, 245.

<sup>984</sup> Memorandum for Brigadier General Kenneth C. Royall, Special Assistant to the Secretary of War, Subject: Hood Committee Investigation – P40 and C46 Foreign Accidents, 31 July 1945.

<sup>985</sup> Report from Colonel George C. Price, Chief, Flying Safety to General Henry H. Arnold, Commander, US Army Air Forces thru Lieutenant General Ira C. Eaker, Deputy Commander, US Army Air Forces, 23 June 1945.

<sup>986</sup> *Ibid.*

concerning defective engines being produced by the Curtiss-Wright company. The Truman Committee, formally known as the Senate Special Committee to Investigate the National Defense Program, announced in July, after a six-month investigation, that the Curtiss-Wright Corporation, with the aid of Army Air Forces personnel, had conspired to sell the government defective engines.<sup>987</sup> Moreover, in an interesting memorandum, the Assistant Chief of the Air Staff for Material and Services reviewed the accidents of four prototype P-80 jet aircraft. He noted the “mechanical failure” in the case of each accident; however, no mention was made of the fate of the pilots.<sup>988</sup>

There were numerous investigations conducted by the Army Air Forces during the war. The Army Air Forces regulation on accidents, Army Air Force Regulation 62-14, “Reporting and Investigation of Aircraft Accidents,” stated that investigations were conducted for one reason: “To establish causes in order that preventive action may be taken.”<sup>989</sup> The regulation set the parameters for all investigations as well: “In order to establish ‘cause,’ the investigation must be thorough, searching, and in detail, and in addition proceed according to a logical plan. Lack of a plan of investigation generally results in overlooking the item responsible for the accident.”<sup>990</sup> According to the regulation, “for study and analysis,” the investigator was to classify accidents by “Cause,” “Nature,” “Results to personnel,” and “Damage to material.”<sup>991</sup> These were to be further sub-divided into three categories: “Major,” “Minor,” and “Underlying.”<sup>992</sup> According to

---

<sup>987</sup> *New York Times*, 11 July 1943.

<sup>988</sup> Memorandum from Major General O. P. Echols, Assistant Chief of Air Staff, Material and Services to Commanding General, Army Air Forces, 29 March 1945.

<sup>989</sup> Army Air Force Regulation 62-14, “Reporting and Investigation of Aircraft Accidents.”

<sup>990</sup> *Ibid.*

<sup>991</sup> *Ibid.*

<sup>992</sup> *Ibid.*

regulation, “Statistically, the ‘Major’ and ‘Minor’ groups are sufficient to provide the necessary data for studies in trends, for studies in control, etc.; however, for critical analysis leading to corrective action, both individually and as a group, the ‘Underlying Cause’ assumes paramount importance.”<sup>993</sup>

The investigating officers were given wide latitude in executing their duties. The regulation noted:

The investigation will be in sufficient detail to determine the nature, cause, and results of the accident or damage. The officer or officers charged with the investigation are authorized to interview witnesses, take testimony, and obtain the professional opinion of experts and to take whatever steps necessary to secure sufficient evidence upon which to base accurate findings.<sup>994</sup>

In one instance, “whatever steps necessary” included drugging a witness. During the investigation into the ditching of a B-17, the investigators noted discrepancies between the pilot’s account and those of some members of the crew.<sup>995</sup> The board received permission to interview the pilot using sodium pentothal.<sup>996</sup> Nevertheless, even under the effects of the drug, the pilot’s account remained the same. The report went on to caution:

The Office of the Surgeon General wishes to make clear its policy on the use of sodium pentothal. Pentothal is to be used in the investigation of aircraft accidents only if a psychiatrically trained medical officer feels that an amnesia exists. Pentothal is not to be used when it is felt that the subject is not telling the truth, unless its use is ordered by the President of

---

<sup>993</sup> Ibid.

<sup>994</sup> Ibid.

<sup>995</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, 8.

<sup>996</sup> Ibid., 8.

the Court Martial Board or by other competent authority. Then it should be given only by a medical officer trained in the use of pentothal and should be given in the presence of competent witnesses.<sup>997</sup>

Regardless of the method of investigation, there were still some accidents where a cause could not be determined. For example, during the first half of fiscal year 1943, investigators were unable to determine the cause in over 35 percent of fatal accidents.<sup>998</sup> Nonetheless, pilot error was still attributed half of the accidents for the year.<sup>999</sup>

At times, the senior leaders of the Army Air Forces believed that more rigorous enforcement of existing regulations and policies would solve the problem. In a letter to Lieutenant General Barton K. Yount, Commanding General Army of the Air Forces Training Command, Lieutenant General Barney Giles, Deputy Commander of Army Air Forces, and Deputy Chief of Staff, voiced his concern over the increasing fatality rate during late 1944. Although he acknowledged that the increase was attributable to the increased use of tactical aircraft in training, General Giles exhorted General Yount to reduce the rate without sacrificing any of the training regimen. He suggested that “increased supervision and enforcement of regulations” would lower the fatality rate.<sup>1000</sup> A copy of this letter was also sent to all major subordinate commanders the same day.<sup>1001</sup> In another instance, in early 1945, Arnold went outside of official channels and personally directed that a special board of “safety and material

---

<sup>997</sup> Ibid., 9.

<sup>998</sup> United States. Army Air Forces, *Accident Facts: U.S Army Air Forces*, 8.

<sup>999</sup> Ibid., 8.

<sup>1000</sup> Letter from Lieutenant General Barney M. Giles, Deputy Commander, Army Air Forces and Chief of Air Staff to Lieutenant General Barton K. Yount, Commanding General Army Air Forces Training Command, 31 Jan 1945.

<sup>1001</sup> Ibid.

experts” be convened to investigate a sudden increase in P-38 accidents.<sup>1002</sup> However, there were other officers, including General Arnold, who believed that direct supervision was the correct response. For example, training visits to airfields by numbered Air Force personnel or directly from the Headquarters Army Air Forces were an important part of improving the quality of training. The official history noted: “These inspectional visits resulted in new suggestions with respect to the content and conduct of training.”<sup>1003</sup>

At other times the findings of the board were little more than mild rebukes. For example, a member of an accident classification committee commenting about ground loop accidents stated: “The student should be emphatically convinced that an airplane is not completely landed until it is parked on the line, the motor shut off, brakes locked, and controls locked.”<sup>1004</sup> In another example, following an accident in advanced flight training, Charles Watry and a fellow cadet appeared before an accident board. Watry had been the co-pilot when the plane “ground looped” as the result of the pilot trying to keep the airplane straight on takeoff. When asked if they had tried to use the brakes to steer the plane, both answered “no,” explaining that they had been taught not to use the brakes to steer their plane.<sup>1005</sup> The incredulous board president admonished Watry and his partner by telling them, “When flying an airplane, boys, use everything you’ve got.”

Other investigations were undertaken as the result of public or official inquiries. In April 1942, Arnold received a note from Colonel Dunn, one of his subordinates, concerning a Congressional investigation. In the letter, Colonel Dunn noted:

---

<sup>1002</sup> Memorandum from Chief of Air Staff to the Deputy Chief of Air Staff, Training, 30 Jan 1945.

<sup>1003</sup> United States Army Air Forces, *Army Air Forces Historical Study No 61: Combat Crew and Unit Training in AAF, 1939-1945*, 62.

<sup>1004</sup> United States Army Air Forces, *Accident Facts: U.S Army Air Forces*, 46.

<sup>1005</sup> Watry, *Washout!: The Aviation Cadet Story*, 116.

...the Congress intends to investigate the alleged high accident rate in the Army Air Forces. While the accident rate has increased, I am not so sure the actual death rate has increased along with it. For mortality figures, statisticians and actuaries all figure the number of deaths against the exposed risk. In all of the figures produced for publication by the Air Forces to date, I have not noticed anything like this.<sup>1006</sup>

As noted previously, the *rate* of accidents did not increase; but no one, including the public, was prepared for the *scale* of accidents and fatalities. This, in turn, led to an increased interest in the Army Air Forces' training and safety procedures. However, the Army Air Forces ran a very effective public relations campaign.

In response to a Congressional inquiry on the number of accidents, a staff officer implied that the Army Air Forces' accident rate had been reduced as a result of the increased emphasis on safety education and training since the start of the war.<sup>1007</sup> In a speech criticizing the Senate War Investigating Committee on 11 January 1945, Senator William Langer of North Dakota also questioned the accident rate in the Army Air Forces. Within five days, the Air Staff had prepared a rebuttal demonstrating that the accident rate had been reduced by 51 percent since Pearl Harbor, while acknowledging that the fatality rate had only been reduced by 10 percent.<sup>1008</sup> At times, the staff had to answer Congressional inquiries about combat accidents. In a letter to her Congressman, Charles L. Gifford, one mother asked if he would inquire into the facts about her son's death as a B-24 pilot in a flying accident over England. From the members of the crew she

---

<sup>1006</sup> Routing and Record Sheet 1942 4-9 from Colonel Dunn to General Arnold. Sub: "High Accident Rate in the Army Air Forces."

<sup>1007</sup> Letter to Congressman Charles L. Gifford from Colonel George C. Price, Chief, Flying Safety, 30 May 1945.

<sup>1008</sup> Memorandum from Colonel George C. Price, Chief, Flying Safety to Deputy Chief of Air Staff, Subject: Senator Langer's Speech, 16 Jan 1945.



ascertained that the plane was “war weary” with over 105 missions to its credit.<sup>1009</sup> In reply to this Congressional inquiry, the Army Air Forces congressional liaison assured Congressman Gifford that there were policies and procedures in place to insure that the emphasis was not only on “getting the planes to the target but on getting them back again.”<sup>1010</sup> The staff officer also informed the Congressman that while “accidents sometimes occur” he should also know that the accident rate had been reduced to a “residual minimum.”<sup>1011</sup>

As the “residual minimum” rate increased with the expansion of the Air Corps, the senior leaders undertook initiatives to address the problem. The primary effort was the establishment of the Safety Section. In July 1941, the Safety Section of the Inspection Division occupied a small office in the headquarters of the Chief of the Army Air Forces.<sup>1012</sup> The Safety Section was under the supervision of a proven test pilot, Captain Samuel R. Harris.<sup>1013</sup> His entire staff consisted of two other officers and six civilians.<sup>1014</sup> However, the official history concluded that the section was not “seriously understaffed” because aircraft accidents were “relatively scarce.”<sup>1015</sup> Nonetheless, Harris prepared a memorandum outlining his vision for the Safety Section. He stated

The objectives of the safety section involve not only the collection and compilation of data, but its statistical analysis and interpretation as well. After valid conclusions have been reached by means of

---

<sup>1009</sup> Letter to the Honorable John M. Robison, House of Representatives from Mrs. Henry C. Howard of Harlan, KY, 16 May 1945.

<sup>1010</sup> Letter to the Honorable John M. Robison, House of Representatives from Colonel Frederick K. Gignoux, Jr., Army Air Forces Branch, Legislative and Liaison Division, 21 Jun 1945.

<sup>1011</sup> Ibid.

<sup>1012</sup> United States Army Air Forces, *History of Flight Training Command, 1 July 1941-17 April 1943*, 1.

<sup>1013</sup> Ibid., 1.

<sup>1014</sup> Ibid., 1.

<sup>1015</sup> Ibid., 2.

scientific statistical analysis and interpretation, action must be taken to apply the knowledge gained to real and practical problems.<sup>1016</sup>

One of two salient points that Harris made to his staff was that data should be collected “[b]y aircraft type in order to determine if a particular aircraft is more dangerous or developing dangerous characteristics.”<sup>1017</sup> The other point presaged the Army Air Forces’ later findings from the stanine exams. Harris noted: “Some pilots are undoubtedly more likely to have accidents than others. These pilots should be given special attention for their own protection and for the conservation of Air Corps equipment.”<sup>1018</sup>

One of Harris’ civilian subordinates, Charles S. Prince, suggested that previous conclusions about accidents might not apply as the Air Corps expanded. Previously, the Air Corps had grouped pilots and accidents “to obtain stratified examples from the universe of data; samples in which the susceptibility to accidents of the individuals is expected to be more or less uniform” for statistical analysis.<sup>1019</sup> As Prince stated in a memorandum for Colonel Harris,

In the past years, the Air Corps pilots have been grouped according to component in an effort to obtain homogeneity in connection with the samples used in the analyses of aircraft accidents. The assumption has been made that the exposure to accidents has been comparable for all pilots in these components, or accident groups, and that the

---

<sup>1016</sup> Memorandum on the Statistical Duties and Objectives of the Safety Section, October 1941.

<sup>1017</sup> Ibid.

<sup>1018</sup> Ibid.

<sup>1019</sup> Memorandum for Major Samuel Harris from Charles Prince, Chief Safety Section, Subject: Discussion and Recommendations Concerning the Grouping of Pilots for Determination of Accident Rates and other Statistical Purposes. 26 November 1941.

susceptibility to accidents of the individual within the accident groups has been similar.<sup>1020</sup>

He concluded that the previous data were based on a relatively stable pilot base that he claimed no longer existed.<sup>1021</sup> He concluded that:

... these assumptions are seriously in error, and that dependable accident statistics have been obtained only because the experience level (a measure of the susceptibility to accidents) of the various accident groups has remained rather constant due to the stability of the strength of the various groups, the similarity of training and operating conditions, and the small number of new, inexperienced pilots whose susceptibility to accidents it can be expected to vary rapidly as experience is gained . . . . This stable condition no longer exists due to the expansion of the Air Corps.<sup>1022</sup>

By 1 December 1941, the staff had grown by 24 civilians but the number of officers remained the same. However, in recognition of his increased duties and responsibilities, Captain Harris was promoted to Major.<sup>1023</sup> Harris interpreted that the mission of the Safety Section should be prevention; however, it was not until December 1941 that he had the personnel to establish a section for statistical analysis.<sup>1024</sup> This section would lay the “foundation for flying safety regulations, instruction and advice.”<sup>1025</sup>

---

<sup>1020</sup> Ibid.

<sup>1021</sup> Ibid.

<sup>1022</sup> Ibid.

<sup>1023</sup> Ibid., 2.

<sup>1024</sup> Ibid., 2.

<sup>1025</sup> Ibid., 2.

In a letter to the Deputy Chief of the Air Staff, Brigadier General Lawrence S. Kuter, Major Harris recommended new safety procedures because of the “alarming increase of the overall accident rate.”<sup>1026</sup> In the same letter, Harris said: “With such an organization set up and operating, the undersigned is willing to state that the accidents can be reduced by 25percent.”<sup>1027</sup> Harris went on to warn that, “If such system is not set up, the present uncontrolled accident problem within the AAF will more than triple itself within the next year.”<sup>1028</sup>

To emphasize this point, Harris’ office put together a presentation outlining the accident and safety issues in the Army Air Forces.<sup>1029</sup> In the presentation, it was stated, somewhat obviously, that, when it came to training, “accidents struck down more pilots and destroyed more equipment” than any other factor.<sup>1030</sup> The presentation attempted to personalize the problem for General Arnold by stating, “Accidents are front page news. The public mind, and the Congress, holds the Commanding General responsible for each one.”<sup>1031</sup> In a plea for funding, the report placed the cost benefit analysis of the program in terms any airman could understand. The cost of the program was estimated to be less than five B-17s.<sup>1032</sup> In return, the study estimated, the savings in lost equipment alone would equip five heavy bomb groups, two medium bomb groups, five light bomb groups, and eight fighter groups.<sup>1033</sup> However, the presentation did point

---

<sup>1026</sup> Memorandum to Brigadier General Lawrence S. Kuter from Major Samuel Harris, reference safety procedures, 3 April 1942.

<sup>1027</sup> Ibid.

<sup>1028</sup> Ibid.

<sup>1029</sup> Flying Safety Presentation book prepared by the Directorate of Flying Safety, 30 July 1942.

<sup>1030</sup> Ibid., 1.

<sup>1031</sup> Ibid., 3.

<sup>1032</sup> Ibid., 3

<sup>1033</sup> Ibid., 3.

out that “In Oct 1941 the Chief of the Air Corps amplified his directive to include accident prevention. No organization or budget was provided.”<sup>1034</sup>

An April 1942 reorganization expanded the role of the Safety Section. The section was renamed the Directorate of Flying Safety, in “official recognition of the inexorable increase of accidents in A.A.F flight training.”<sup>1035</sup> This reorganization meant a promotion for Major Harris to Lieutenant Colonel and for the first time a more precise mission for the Directorate:

To develop, implement, regulate, investigate and inspect systems and methods of accident control, including systems and methods of personnel control and flight control.

To inspect and investigate conditions, practices, equipment and facilities which may affect safety in flight, and to take necessary corrective action.

To supervise the investigation of aircraft accidents, including the development and regulation of the aircraft accident reporting system.

To approve all regulations concerning aircraft operation, either in flight or upon the ground, which may affect safety of personnel or material.<sup>1036</sup>

One of Lieutenant Colonel Harris’ first measures was to divide the continental United States into ten “safety regions in order to facilitate inauguration and maintenance of the policies set forth in the Directorate’s mission.”<sup>1037</sup> In addition, the authorized strength of the directorate

---

<sup>1034</sup> Ibid., 2.

<sup>1035</sup> Ibid., 3.

<sup>1036</sup> Ibid., 4.

<sup>1037</sup> Ibid., 3.

was increased to 34 officers and 96 civilians. However, the Army Air Forces moved slowly with funding so that, for 1942, Harris's staff remained three officers and 40 civilians.<sup>1038</sup> However, Lieutenant Colonel Harris must shoulder some of the blame for this shortfall. He realized that he had to be judicious in selecting his regional safety officers because they would require specialized skills that few officers possessed.<sup>1039</sup> As he noted in the presentation: "Assignments were made as qualified officers were found, but actually, the safety regions have always remained under-manned."<sup>1040</sup> Nonetheless, the following statement appeared in a *New York Times* article announcing the formation of the Office of Flying Safety:

Safety in Flying has been made the responsibility of a board headed by Colonel Samuel R. Harris Jr.<sup>1041</sup> This board has wide authority to recommend regulations for prevention of accidents and to check the causes that may be due either to mechanical or human failures.<sup>1042</sup>

Only a few months before this action, Colonel Arthur Ennis, the chief of the public relations office of the Air Corps, told a local VFW post that the accident rate was low "because of the high standards [in training] set throughout the country."<sup>1043</sup>

In December 1942, the Directorate of Flying Safety was reorganized once again and was renamed the Directorate of Air Traffic and Safety with three sub-directorates: Flying Safety, Safety Education, and Flight Control.<sup>1044</sup> This new organization, still under the direction of

---

<sup>1038</sup> Ibid., 3-4.

<sup>1039</sup> Ibid., 4.

<sup>1040</sup> Ibid., 5.

<sup>1041</sup> At the time of this article, Harris was still a Lieutenant Colonel.

<sup>1042</sup> *New York Times*, 17 July 1942.

<sup>1043</sup> *New York Times*, 5 February 1942.

<sup>1044</sup> Ibid., 5.

newly promoted Colonel Samuel Harris, was now authorized 365 officers and 3,664 civilians.<sup>1045</sup>

In addition, Colonel Harris gave his new organization an updated mission statement:

To develop a program to reduce aircraft accidents; to inspect all Army Air Forces activities; to determine adequacy of safety measures and compliance with safety regulations; to establish, supervise and regulate a system of aircraft accident investigation and reporting, and to secure and analyze reports of aircraft accidents, to provide statistical data thereon, and to recommend safety measures and procedures.<sup>1046</sup>

This was followed by a press release from the Information Office of the War Department concerning training accidents and the Army Air Forces' measures to address this problem:

As training accidents in such planes are often fatal, the Director of Air Traffic and Safety has initiated research to offset the natural hazards of this type of high performance plane, both by safety education to eliminate personnel errors, and through the design and installation of structural safety devices.<sup>1047</sup>

The Directorate of Flying Safety continued with its duties and missions as before by collecting and analyzing data. This was an ongoing process as the number of accidents continued to increase throughout the war. For example, in May 1945 the Office of Flying Safety instituted a study into "accident patterns."<sup>1048</sup> The study would be based on the "accident experiences of this Command in specific phases of training and in the operation of specific type of aircraft with detailed types and causes of accidents in order of frequency of occurrence and severity of results

---

<sup>1045</sup> Ibid., 7.

<sup>1046</sup> Ibid., 6.

<sup>1047</sup> Ibid., 6.

<sup>1048</sup> Memorandum from the Office of Flying Standards to the Chief Directorate of Flying Safety, 15 May 1945.

together with preventive suggestions and recommendations.”<sup>1049</sup> In February 1945, the Office of Flying Safety automated the process of collating data by using punch cards to sort accident data.<sup>1050</sup> The data from this streamlined process were then used to produce a monthly bulletin about aircraft accidents.<sup>1051</sup> This bulletin would, among other things, “include a summary of the accident situation and appropriate comparisons of accidents by commands, phases of training, type of aircraft, cause of accident, etc.”<sup>1052</sup> The first issue was published in April 1945.<sup>1053</sup>

The Directorate of Flight Control was the largest of the sub-directorates with 256 officers and 3,337 civilians. Its mission was to supervise and establish standard procedures for flight operations on the ground and in the air. Its efforts included visits to the training airfields by personnel from the Directorate and the institution of new programs. For example, in August 1945, members of the Directorate visited airbases to discuss the “present high accident rate” and to explore possible solutions in order to bring the number of accidents back down.<sup>1054</sup> One of the most ambitious programs was an accident prevention course. In mid-1945, the Directorate of Air Traffic and Safety proposed establishing a one-week accident prevention course for base safety officers.<sup>1055</sup> The first class was scheduled to begin in late August with 35 students.<sup>1056</sup> However, because of a higher than usual number of transfers within Air Training Command to meet wartime needs, the Directorate requested a 30-day delay.<sup>1057</sup> In October 1945, the school was

---

<sup>1049</sup> Ibid.

<sup>1050</sup> Memorandum from the Office of Flying Standards to the Chief Directorate of Flying Safety, 15 February 1945.

<sup>1051</sup> Ibid.

<sup>1052</sup> Ibid.

<sup>1053</sup> Memorandum from the Office of Flying Standards to the Chief Directorate of Flying Safety, 15 April 1945.

<sup>1054</sup> Memorandum from Directorate of Air Traffic and Safety, Office of Flying Standards, 14 August 1945.

<sup>1055</sup> Ibid.

<sup>1056</sup> Ibid.

<sup>1057</sup> Ibid.



cancelled without ever having met. The reason given was that the school should not be a function of the Headquarters, Army Air Forces; rather it was a “function of the various Commands and Air Forces,” and, therefore, it was the responsibility of these subordinate organizations to manage and supervise such a course.<sup>1058</sup>

The most innovative of the directorates was the Directorate of Safety Education. This Directorate was the smallest of the organizations with only 41 officers and 45 civilians; however, it probably had the biggest effect on flying safety in the Army Air Forces. While its mission was straightforward, the Directorate’s influence would be far-ranging. Its target audience included not only Army Air Forces personnel, but also the American public. As its mission stated, the Directorate of Safety Education was tasked:

To determine the educational requirements of the Army Air Forces and the general public in matters pertaining to the Directorate of Air Traffic and Safety and its sub-directorates; to produce or obtain such educational material, using any desired media; to direct the distribution of such educational material, both within the Army Air Forces and to the public; to coordinate with the War Department Bureau of Public Relations on all matters involving public release of information.<sup>1059</sup>

The directorate produced pamphlets, posters, and films to get the safety message out to the Army Air Forces. Some of its efforts included numerous training films from the “How to Fly” series for every major aircraft in the Army Air Forces inventory to aircraft recognition and the fundamentals of gunnery. These films starred many famous actors of the era, such as James Stewart, Ronald Reagan, and Burgess Meredith, adding to the movies’ appeal to the public at

---

<sup>1058</sup> Ibid.

<sup>1059</sup> Ibid., 7.

large as well as members of the Army Air Forces. It was also the organization responsible for the illustrated primary flight manuals for instructors and students discussed in Chapter 4. These manuals were so effective and popular that the Directorate of Air Traffic and Safety devoted several pages to the success of both manuals in its semi-annual report for the Chief of the Army Air Forces.<sup>1060</sup> In addition, the Directorate was praised by pilots for its revision of the Pilot's Information File from "a dull, thick compendium of complicated technical orders... to a readable, brief notebook."<sup>1061</sup> In producing another popular booklet, *I've Got Wings*, the Directorate utilized, according to the official history, "the Disney technique of giving distinct personalities to things as well as animate beings" in order to explain "Army Air Force Regulations."<sup>1062</sup> In the booklet the main character was a goggled pilot who was accompanied by a goggled bird "and [by] planes which register horror, contentment, anxiety, or confusion, as the case may be" as the pilot was placed in various situations that a real pilot might find himself.<sup>1063</sup> Another initiative was the publication of an illustrated accident report to bring "preventive lessons" from the accident reports to the attention of the aircrews.<sup>1064</sup> It was intended that this publication would be "posted on bulletin boards, discussed at meetings, and maintained in reading files."<sup>1065</sup>

Other means of dissemination included more mundane methods such as meetings and conferences. For example, following a conference of representatives from 2<sup>nd</sup> Air Force and Air Training Command in 1943 on B-17 and B-24 transition training, the panel of officers recommended that accident data and reports be widely distributed to insure better understanding

---

<sup>1060</sup> History of the Office of Flying Safety, 1943, 57-60.

<sup>1061</sup> Memorandum from Directorate of Air Traffic and Safety, Office of Flying Standards, 14 August 1945. 7.

<sup>1062</sup> History of the Office of Flying Safety, 1943, 57-60.

<sup>1063</sup> Ibid.

<sup>1064</sup> Memorandum from the Office of Flying Standards to the Chief of the Army Air Forces, 15 February 1945.

<sup>1065</sup> Ibid.

of recurring problems throughout the training base.<sup>1066</sup> Even though the Civilian Pilot Training Program (CPTP) was made up of independent contractors, their policies on reporting training accidents in primary flight training accidents mirrored the Army Air Force. The CPTP policy was to analyze the written report concerning each accident and then forward that analysis and recommendations to all schools.<sup>1067</sup> In addition, the Army Air Forces formed a Safety Council composed of safety officers from the subordinate commands. The council met monthly to discuss current safety issues and make recommendations. These findings were distributed to all airfields and commands in the Safety Council minutes.

Many of the recommendations of the Safety Council reflected a shift to more bureaucracy in the Army Air Forces regarding safety in general and accident prevention and reporting in particular. For example, in August 1945 when drowning deaths were on the rise, the Council suggested that 50,000 cards on swimming safety be published and distributed.<sup>1068</sup> Statistics, gathered by the Office of Flying Safety, indicated that accidents due to pilot error were more likely to involve pilots with significantly lower aptitude scores on their stanine test. The Council recommended that a standardized checkout procedure be adopted.<sup>1069</sup> In June 1945, one of the agenda items for the Council was a concern that there were not enough safety posters in the theaters of operation.<sup>1070</sup> At the same council meeting, the safety officers who had gathered recommended that aircraft be marked with larger identification numbers so it would be easier to

---

<sup>1066</sup> United States Army Air Forces, *Army Air Forces Historical Study, no 18: Pilot Transition to Combat Aircraft*, 152.

<sup>1067</sup> Patricia Strickland, *The Putt-Putt Air Force: The Story of the Civilian Pilot Training Program and the Wartime Training Service (1939-1944)*, Vol. GA-20-84 (Washington DC: Federal Aviation Administration, 1971), 69.

<sup>1068</sup> Safety Council Minutes, 3 August 1945.

<sup>1069</sup> Safety Council Minutes, 6 July 1945.

<sup>1070</sup> Safety Council Minutes, 1 June 1945.

report a pilot when he violated regulations.<sup>1071</sup> The creeping influence of bureaucracy can also be detected in the inclusion of a section in the monthly memorandum from the Office of Flying Safety for those commands that had submitted “Unsatisfactory Reports.”<sup>1072</sup> For example, the entry for 30 June noted that on a “considerable number” of AAF Form 14 Accident Reports, Section L7, General Information, was left blank.<sup>1073</sup> Another example was that stations were not submitting properly prepared accident reports and that this was causing an unspecified “unsatisfactory condition.”<sup>1074</sup> However, some of the advice was at times so obvious or else so vague as to be practically useless. For instance, a 1<sup>st</sup> Air Force safety bulletin concerning airplane fires admonished: “Do your best to combat engine fires but do not stay with the ship so long that you are trapped.”<sup>1075</sup> On the other hand, the individual commands were given some latitude to adjust training requirements. For example, the commander of the 2<sup>nd</sup> Air Force was concerned that one of the training requirements for his bomber crews was for them to fly in a “four group formation.” His concern was that this requirement meant that up to 72 planes would be flying in close proximity. The commander did not believe it was “practical to include this size formation in the training program.”<sup>1076</sup> Therefore, in the name of safety, 2<sup>nd</sup> Air Force dropped the requirement even though it was “desired by Washington.”<sup>1077</sup> However, the directive from

---

<sup>1071</sup> Ibid.

<sup>1072</sup> Memorandum from Office of Flying Standards, 30 June 1945.

<sup>1073</sup> Ibid.

<sup>1074</sup> Memorandum from Office of Flying Standards, 30 August 1945.

<sup>1075</sup> 1st Air Force, *That You may Live: 1st Air Force Safety Bulletin*, 5.

<sup>1076</sup> Ibid.

<sup>1077</sup> 2<sup>nd</sup> Air Force Flight Training Directive, 1943.

2<sup>nd</sup> Air Force gave subordinate Wing Commanders the latitude to conduct “four group formation” training if they found it “practical.”<sup>1078</sup>

Nonetheless, as the war progressed, a sense of flying safety began to permeate the Army Air Force. A 1943 press release referred to the safety officers as a “force of field officers” sent out to aid commanders as “missionaries of flying safety.”<sup>1079</sup> In a letter to his subordinates, the commander of Air Training Command emphasized that among the keys to improving flight safety was the need for “continuous education and training” and “maintaining realistic discipline programs.”<sup>1080</sup> In a memorandum from the Deputy Chief of the Air Staff, to the commander of Air Training Command discussed some of the measures he was taking to reduce the accident rate.<sup>1081</sup> These included transferring more experienced personnel to bases with higher accident rates, new training programs such as a two-week Flight Planning course, and insuring that returning combat pilots understood their responsibilities in training command.<sup>1082</sup>

At all levels commanders appeared to be trying to outdo each other in safety and accident prevention. After taking command of the Pacific Division of Air Training Command, Brigadier General William H. Tunner reported to his superior that he had appointed a Division Flying Safety Officer and a Flying Safety Committee where there had been none before.<sup>1083</sup> He also reported that he was waiting on funding to begin publishing his own “graphic anti-accident

---

<sup>1078</sup> Ibid.

<sup>1079</sup> United States Army Air Forces, *History of Flight Training Command, 1 July 1941-17 April 1943*.

<sup>1080</sup> Memorandum from Commander Air Training Command to Commander Ferrying Command, 29 Sep 1944.

<sup>1081</sup> Memorandum from Lieutenant General B. K. Yount, Commander Army Air Forces Training Command to Deputy Chief of Air Staff, Feb 1945.

<sup>1082</sup> Ibid.

<sup>1083</sup> Memorandum from memo from Commander, Pacific Division, Air Training Command to Commander Air Training Command, 14 Jan 1945.

bulletins.”<sup>1084</sup> In another example, the commander of Air Transport Command, in response to a request from the Chief of Air Staff on accident prevention and reduction, provided two and one half pages discussing the procedures in his command.<sup>1085</sup> In the event that his superior still did not understand how much he was emphasizing safety, he included nine enclosures supporting his position.<sup>1086</sup>

However, this attitude towards safety was not limited to the Army Air Forces. Beginning in 1942, the National Safety Council, for every six-month period, established the “Wings for Victory” award for the primary, basic, and advanced school with the lowest accident rate in each training command.<sup>1087</sup> For example, the *New York Times* reported that the National Safety Council awarded the honor to Western Flying Command for the second half of 1944.<sup>1088</sup> The new zeal for flight safety even reached down to the public high schools. A 1945 Army Air Force press release reported that one of the missions of the Safety Education Office was to “inculcate in the minds of the Army Air Forces pilots of tomorrow the principles of flying safety.”<sup>1089</sup>

In the end, the effort paid off. One example from Randolph Field brought all the measures of flight safety that had been developed throughout the war to bear on an increase in AT-6 accidents. The Office of Flying Safety assigned an Accident Officer to each squadron to increase safety awareness and to implement safety procedures.<sup>1090</sup> These measures included posters, briefings, and a written exam for all pilots covering safety procedures and Pilot

---

<sup>1084</sup> Ibid.

<sup>1085</sup> Letter from Commander Air Transport Command to Deputy Chief of Air Staff, 10 Feb 1945.

<sup>1086</sup> Ibid.

<sup>1087</sup> Memorandum from Office of Flying Standards, 14 March 1945.

<sup>1088</sup> *New York Times*, 10 May 1945.

<sup>1089</sup> United States Army Air Forces Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 48.

<sup>1090</sup> United States Army Air Forces, *History of the Army Air Forces Pilot School (Specialized VHB) Randolph Field, Texas, Eighth Bimonthly Supplement, 1 May 1945-1 July 1945*, 206.

Information File material.<sup>1091</sup> After implementation of these measures, one base official noted, “the accident rate has sharply decreased in the past two months.”<sup>1092</sup> In July 1944, the Army Air Force informed the *New York Times* that “The rate of aircraft accidents and of fatalities in the Army Air Forces operations in this country decreased substantially during the first five months of this year, compared with the corresponding period last year.”<sup>1093</sup> While the lower rate of accidents and fatalities might be attributed to many factors, not the least being the decreased pressure to produce pilots, the Army Air Forces credited the lower rates to “the emphasis placed on flying safety.”<sup>1094</sup>

---

<sup>1091</sup> Ibid., 206.

<sup>1092</sup> Ibid., 206.

<sup>1093</sup> *New York Times*, 22 July 1944.

<sup>1094</sup> Ibid.

## Chapter 6 - Conclusion

...the art of flying is not the simple, courageous, carefree, chance occupation of irresponsible adventurers . . . The men who fly airplanes have a profession.

Our superlative, prewar, tailor-made flyers, good as they were, have not proven superior to the mass-production flyers turned out in great quantity from our wartime schools.<sup>1095</sup>

General Henry H. Arnold from *This Flying Game*.

Both of Arnold's statements capture the changes that took place in the Army Air Forces as a result of its wartime experience. This change was best summed up in a July 1944 memorandum from the Chief of the Office of Flying Safety to the Deputy Chief of Air Staff, outlining the procedures and policies of the Office of Flying Safety. In the memorandum, the Chief criticized the Army Air Forces' past and commented on its future:

The day of swashbuckling, irresponsible flying is gone. It may have been all right to tolerate an occasional violation when the Air Corps consisted of 1,000 pilots. But, when the records for one month, December 1943, show that 153 accidents involved a violation and out of 153, 147 accidents were the direct result of violations, it is time to take immediate and drastic action. Of these accidents involving violations, 25 were fatal, producing 58 fatalities. Aircraft wrecked or damaged are estimated to cost more than \$8,000,000.<sup>1096</sup>

---

<sup>1095</sup> Henry Harley Arnold and Ira Clarence Eaker, *This Flying Game*, 3d ed. (New York, London: Funk & Wagnalls Company, 1943), 100, 122.

<sup>1096</sup> Memorandum from Colonel George C. Price Chief of Flying Safety to Deputy Chief of the Air Staff, 11 July 1944.



The Chief went on to complain that many times these accidents also caused damage to private property, thus burdening the Army Air Forces not only with a monetary cost but also with a “serious public relations problem.”<sup>1097</sup> Moreover, in the same memorandum the Office of Flying Safety cautioned: “As the European war passes its climax, public and congressional attention will be focused more and more on Army Air Forces domestic accidents. Relaxing of pressure on the training program will require more, not less, emphasis on accident prevention.”<sup>1098</sup>

The Chief of Flying Safety may have been overstating that the flyers of the prewar Air Corps were “swashbuckling and irresponsible;” however, since he was speaking as a prewar flyer himself there must be a grain of truth in his statement. Nevertheless, the postwar Army Air Forces did shed some of its “club-like” culture, as Curtis LeMay referred to it, over the course of the war. Gone were the days when a pilot could pull a stunt such as James Doolittle, on nothing more than a dare, sitting between the wheels of airplane as it landed and receiving only a rebuke from his commander. Over the course of the war, regulations were rigidly enforced and violations dealt with appropriately. For example, in one instance President Roosevelt tried to intervene in the case of a pilot, because the pilot was a West Point graduate, who had violated regulations. The Air Staff refused to change the punishment. In a letter to the President concerning the case, the Chief of the Air Staff stated that the Army Air Forces’ position was that the rules and regulations applied equally to all officers regardless of commissioning source.<sup>1099</sup> These changes could be attributed to the massive expansion of the Army Air Forces. With tens of thousands of pilots entering the service, it was no longer possible to build the close-knit

---

<sup>1097</sup> Ibid.

<sup>1098</sup> Ibid.

<sup>1099</sup> Memorandum from Major General Laurence S. Kuter, Acting Chief of Air Staff to Colonel Richard Park, Military Aide to the President, 14 April 1945.

relationships that characterized the prewar Air Corps. Moreover, the increasing size of the Army Air Forces dictated a larger bureaucracy to manage selection, training, procurement, and safety.

On the other hand, perhaps, the Army Air Forces, much like the interwar Air Corps, was reflecting the continuing pursuit of safety in the society in general. For example, in 1947 the National Safety Council began the Green Cross for Safety program. The program was piloted in twenty cities around the nation.<sup>1100</sup> The National Safety Council produced statistics that indicated, over a five year period, that in areas where “strong, continuing, over-all safety programs” existed, there was a “25 to 40 per cent” reduction in accident rates.<sup>1101</sup> Founded in 1913, the National Safety Council received a congressional charter in 1953. At the council’s 41<sup>st</sup> congress and convention, the charter was presented by Congressman Clifford Davis of Tennessee.<sup>1102</sup> In his speech to the convention, Davis told the audience that:

...the charter symbolized “the confidence and trust reposed in the council by the Government of your country.”

“May you accept it,” he added, “as your authority to continue to increase your efforts to make the nation safer.”

The postwar Army Air Forces was also concerned about flight safety, both internally and externally. For example, in early 1943 the Army Air Forces was aware that the public was becoming concerned over the ever increasing number of accidents in training. The concern, among the Army Air Forces leaders, such as Arnold, was that the American public did not grasp the tremendous increase in hours and miles being flown and were only being told about the accidents. The report concluded: “The accident problem is serious but it is far from being as

---

<sup>1100</sup> *New York Times*, 4 January 1948.

<sup>1101</sup> *Ibid.*

<sup>1102</sup> *New York Times*, 20 October 1953.

alarming as regular reading of newspapers would lead the average citizen to believe.”<sup>1103</sup> During the war, the Army Air Forces undertook massive public relations campaign to assure the American people that USAAF was taking all the necessary steps to make military flying as safe as possible. The postwar Army Air Forces continued these steps, first by making the Office of Flying Safety a permanent organization, in the closing months of World War Two, under the command of a “Regular Army” colonel.<sup>1104</sup> In addition, as planes became not only more complex but also more expensive, the Army Air Forces couched its emphasis on safety in economic terms. For example, a postwar study noted: “Now that the war is over, aircraft accidents can no longer be condoned in terms of military necessity, but must be measured in terms of *economic waste*.”<sup>1105</sup>

Moreover, the Army Air Forces wanted to pass this newfound zeal for safety on to commercial aviation. The same postwar study concluded that, “The AAF must not only assure a high degree of safety for its own postwar operations, but it also has the responsibility and opportunity to translate its wartime experience into the promotion of safety in civil aviation.”<sup>1106</sup> However, the Army Air Forces placed its support for civil aviation flight safety in the context of national defense. The Air Staff postulated that the size and funding for the Army Air Forces would be influenced by public perceptions and acceptance of aviation as a viable and safe mode of transportation. A postwar study noted: “Public acceptance of aviation as a principal segment

---

<sup>1103</sup> United States. Army Air Forces, *Accident Facts: U.S Army Air Forces* (Winston-Salem NC: The Flight Control Command, 1943), 3.

<sup>1104</sup> Memorandum from Brigadier General Ray L. Owens, Deputy Chief of the Air Staff to the Chief of the Air Staff Personnel Section, 22 May 1945.

<sup>1105</sup> United States Army Air Forces, Office of Flying Safety, *Safety as a Factor in the Future of Aviation* (Washington DC: Chamber of Commerce of the United States of America, 1946), 4.

<sup>1106</sup> *Ibid.*, 6.

of the transportation system will to a major extent provide the basis for national security.”<sup>1107</sup>

The report concluded: “. . . the degree of safety which can be achieved in private and commercial flying becomes a matter of primary national concern.”<sup>1108</sup> In addition, many, such as Carl Spaatz, the first Chief of Staff of the Air Force, were concerned about the effect of the rapid demobilization on readiness. In November 1945, only two months after the end of the war, Spaatz warned that the “hysterical demobilization” would contribute to “a rising curve of flying accidents, due to the loss of experienced ground personnel.”<sup>1109</sup> In another example, George Kenney, the first commander of Strategic Air Command, and his deputy, Major General Clements McMullen, looked for ways to make this new command more efficient with limited personnel and equipment. As airpower historian Herman S. Wolk has noted, Kenney’s efforts worked but “neglected the training of combat crews.”<sup>1110</sup>

This is not to say that the postwar Air Force did not face challenges that required courageous pilots willing to accept the risks inherent in flying. The challenges for the postwar pilots were no less dangerous than those faced by the prewar pilots. The Arnolds, Spaatzs, and Eakers of the prewar Air Corps and earlier learned how to master problems such as long distance navigation through flights such as Eaker’s transcontinental flight using nothing but instruments, or discovering the potential endurance of aircraft and aircrews in flights such as the *Question Mark* endurance flight in January 1929. The postwar pilots were challenged with mastering the problems that turbine engine technology presented. For example, one of the first was trying to fly faster than the speed of sound (breaking the sound barrier). As the *New York Times* reported, the

---

<sup>1107</sup> Ibid., 1.

<sup>1108</sup> Ibid.

<sup>1109</sup> *New York Times*, 16 November 1945.

<sup>1110</sup> John L. Frisbee and United States. Air Force. Office of Air Force History, *Makers of the United States Air Force* (Washington DC: Office of Air Force History, 1987), 147.

early attempts had “already killed some daring pilots.”<sup>1111</sup> However, pilots such as Captain “Chuck” Yeager continued to try, and Yeager finally broke the sound barrier in October 1947. It should be noted that Yeager was a product of the Army Air Forces’ more structured wartime selection and training process.

Throughout the interwar period, the Air Corps maintained strict standards for acceptance into flight training. However, with limited budgets it was easy for the Air Corps to limit the number in training. By 1939, the Air Corps was faced with the problem of recruiting and selecting enough cadets to meet President Roosevelt’s vision for an expanded air force. Based on its experience up to that point, the Air Staff expected that up to 50 percent of those who entered flight training would wash out before earning their wings. The challenge for the Air Corps was how to adjust the standards to allow more young men to apply while at the same time ensuring that only those with the potential for completing flight training were selected.

The Air Corps increased the pool of applicants by accepting graduates of Civilian Pilot Training Program, by eliminating the college education requirement, and by opening up flight training to enlisted soldiers. Although the Air Staff was initially hostile to the CPTP because they were not sure of the quality of the pilots that a civilian school could produce, wartime requirements forced the Air Staff to accept them. Moreover, by the end of the war, Arnold praised the contribution of the program to the war effort.<sup>1112</sup> Arnold reluctantly eliminated the requirement for a minimum of two years of college and replaced it with a qualification exam. This action made it possible for those with native intelligence who lacked the means to attend college to have the opportunity to become military pilots. In addition, it was a move that was

---

<sup>1111</sup> *New York Times*, 23 December 1947.

<sup>1112</sup> United States. Army Air Forces and Henry Harley Arnold, *Report of the Commanding General of the Army Air Forces to the Secretary of War* (Washington DC: US GPO, 1944).

praised by many both inside and outside the Air Corps. Eliminating the college education requirement and opening up training to enlisted soldiers insured that the Army Air Forces received the best and the brightest from its own ranks. Men such as “Chuck” Yeager more than proved the worth of the program. Nonetheless, these programs did not survive long after the war. The CPTP was ended in 1944 after the demand for pilots decreased. The college education requirement was reinstated after the war though the qualification exam was kept for classification purposes.

However, the postwar Air Force did retain from the selection process the three tests that made up the classification system. These exams consisted of a pencil and paper test of general knowledge, a psychomotor exam, and a psychological evaluation by a trained psychologist. The general knowledge test evaluated the cadets understanding of maps, charts, principle of mechanics, and the “ability to understand technical information.”<sup>1113</sup> The psychomotor examination placed the cadet in various situations to test, among other things, his manual dexterity and reactions to changing stimuli.<sup>1114</sup> However, it was the psychological evaluation that the cadets feared most. It was one thing to wash out because one lacked the physical ability for flight training but quite another to not be accepted because one had misread an inkblot.<sup>1115</sup> Based on his score on these three tests, a cadet was assigned his Standard Nine or stanine score that marked him for a particular specialty — pilot, navigator, or bombardier. By the end of the war, the Air Staff was confident that they had perfected a system for the selection and classification of aircrew that was superior to the prewar model

---

<sup>1113</sup> Charles A. Watry, *Washout!: The Aviation Cadet Story*, 1st ed. (Carlsbad CA: California Aero Press, 1983), 49.

<sup>1114</sup> *Ibid.*, 49.

<sup>1115</sup> Eugene Fletcher, *Mister: The Training of an Aviation Cadet in World War II* (Seattle WA: University of Washington Press, 1992), 22.

Over the course of the war, the Army Air Forces' training methods for these specialties — pilot, bombardier, and navigator — changed as well. Whereas the prewar Air Corps cadet would undertake primary flight training at a centralized facility, it was the responsibility of the squadrons and groups to complete the pilot's training after he earned his wings in primary flight training. As the Air Corps began to expand in 1939, Arnold and the Air Staff realized that this method of making "tailor-made" flyers would not work for the larger force. By 1943, the Army Air Forces was taking a more systematic approach to training by identifying tasks, conditions and standards for each phase of training and checklists so the instructors could log the progress of the pilots and crews as they completed flight training.<sup>1116</sup> For example, in 2<sup>nd</sup> Air Force, at least four different multiple-part forms had to be maintained for every training flight. These forms were collected by the airplane commander and were carried by the crew to deliver to their new group so the commander could evaluate the level of training of the crew he was receiving.<sup>1117</sup>

Moreover, in the prewar Air Corps the positions of bombardier, navigator, and gunner were considered additional skills that anyone could pick up. In particular, the conventional wisdom in the Air Corps was that a good pilot could be a good navigator. Even more interesting is the fact that the prewar Air Corps, despite its doctrine of high-altitude precision bombing, did not make the position of bombardier a distinct specialty. Nonetheless, in the crucible of combat it became apparent that navigators, bombardiers, and gunners required specialized training, and the Air Staff established specialized schools for each position. In addition, as discussed previously, the Army Air Force began selecting for those positions based on a cadet's stanine score.

---

<sup>1116</sup> 2nd Air Force, *Second Air Force Flight Training Directive for Combat Crews* (Colorado Springs CO: United States Army Air Forces, 1943).

<sup>1117</sup> *Ibid.*, 5-6.

The postwar Army Air Force retained nearly all of the wartime selection process; however, pilot training was divided into two six-month phases, primary and basic rather than the wartime phases of primary, basic, and advanced. In addition, the Air Force would eliminate the Aviation Cadet program in 1962. After that year, every pilot entering training would already be a commissioned officer and would earn his wings only upon graduation from basic flight training.

By the end of the war, the Army Air Forces had developed numerous programs to investigate, classify, and prevent accidents. Beginning with the establishment of the Office of Flying Safety in 1942, the Army Air Forces took positive steps to address the accident rate. Throughout the war, the Office of Flying Safety produced manuals, pamphlets, posters, and even animated shorts to educate the force on safety. Moreover, the efforts paid off as the various commands vied with each other over their safety records.

Despite the best efforts of the squadron and group commanders, accidents could not be completely prevented. For example, the Medical Safety Section bulletin for January 1946 reported that November 1945 had the highest incidence of accidents since the wartime high in December 1943.<sup>1118</sup> The same report placed the blame for the increase on “personnel errors” and recommended more training, refresher courses, and reminders to the pilots, crews, ground personnel that “safety in flight demands their best efforts.”<sup>1119</sup> The report warned that short cuts in such things as control tower operations “may have been acceptable under wartime conditions but should not be condoned in peacetime.”<sup>1120</sup> In another instance, future astronaut Michael

---

<sup>1118</sup> Medical Safety Division, *Accident Bulletin for Medical Investigators*, Vol. 3 (Washington DC: United States Army Air Forces, 1946), 1.

<sup>1119</sup> *Ibid.*, 2.

<sup>1120</sup> *Ibid.*, 3.



Collins recalled that in 1952 his advanced combat training class lost two pilots a week during the eleven-week course.<sup>1121</sup>

Shortly after the end of the war, the Army Air Forces undertook a massive study of the safety problem during the war. Published in 1946, *Safety as a Factor in the Future of Aviation* analyzed every aspect of the wartime safety issues in order to determine not only where military aviation could improve but also what steps civil aviation could take to improve. The study noted: “Safety must be engineered into the aircraft in a positive manner which will eliminate partially or altogether many of the opportunities now afforded the human being to make errors.”<sup>1122</sup> This was supported by a postwar study by the Office of the Air Surgeon that found some accidents attributed to “pilot error” were sometimes due to poor design or control layout.<sup>1123</sup> This in turn led the Army Air Force to reassess some of its conclusions concerning pilot error. The authors of *Safety as a Factor* noted: “For airplanes performing fairly similar missions and operated by personnel of generally equal capabilities, rate variations suggest that the aircraft themselves, rather than those who fly them, may be chiefly responsible for the differences in accident frequency.”<sup>1124</sup> In another instance, the report concluded that when it came to comparing the accident rate for taxiing collisions between conventional and tricycle landing gear aircraft that tricycle landing gear equipped had a lower rate because of the better visibility out of the cockpit. In the report’s words, “And while these accidents are immediately attributable to pilot error, basically it is the airplane which is blind, and not the pilot.”<sup>1125</sup> The study also hinted that safety

---

<sup>1121</sup> Tom Wolfe, *The Right Stuff*, New ed. (New York: Farrar, Straus, Giroux, 1983), 21.

<sup>1122</sup> United States Army Air Forces, Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 27.

<sup>1123</sup> United States Army Air Forces, Office of the Air Surgeon, *Stanines: Selection and Classification for Air Crew Duty* (Washington DC: US GPO, 1946), 46.

<sup>1124</sup> United States Army Air Forces, Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 27.

<sup>1125</sup> *Ibid.*, 27.

was compromised as “wartime circumstances dictated that speed and volume of aircraft production should govern AAF procurement.”<sup>1126</sup>

It would be logical to assume that safety was “compromised” because of “wartime circumstances” but the record would indicate otherwise. By the end of the war over 15,000 pilots and aircrew had been killed in accidents within the continental United States.<sup>1127</sup> That was the equivalent of a wartime infantry division, lost without firing a shot. A postwar report noted:

Accident reports received from both the U. S. and overseas reveal that non-combat accidents have numbered in the tens of thousands. The Commanding General of the AAF reported, for example, that during the first 32 months of the war a total of approximately 11,000 aircraft had been lost in wrecks in the U. S. alone, compared to 7,700 lost on combat missions either to known enemy action, or to unknown causes with enemy aircraft present.<sup>1128</sup>

The same report concluded that these were acceptable losses by noting:

The heavy accident toll experienced during the hurried wartime expansion of the AAF was the price which had to be paid to achieve the air power required for victory. That price was accepted as part of the cost of the war.<sup>1129</sup>

Nonetheless, in the face of these losses and the demand for more trained aircrews, the Army Air Forces became more safety conscious and changed the culture of the Air Force. In his final

---

<sup>1126</sup> Ibid.

<sup>1127</sup> Anthony J. Mireles, *Fatal Army Air Forces Aviation Accidents in the United States, 1941-1945* (Jefferson NC: McFarland, 2006), xi.

<sup>1128</sup> United States Army Air Forces, Office of Flying Safety, *Safety as a Factor in the Future of Aviation*, 4.

<sup>1129</sup> Ibid., 4.

report to the Secretary of War, Arnold referred to the “vigorous preventative measures” the Army Air Forces undertook to control the accident rate. What Arnold failed to mention, and very well may not have known, was the fact that those measures were the result of the prewar Army Air Corps transitioning from a “small and fixed group of men,” as he referred to them, comfortable with a more open approach to training and accidents to the more bureaucratic and structured approach to selection, training, and safety that the Army Air Forces embraced coming out of the war.

There were, if not readily apparent, implications of this transition for the US Air Force. In 1947, the Air Force finally gained its long-sought independence from the Army. The leaders of the new Air Force, men such as Spaatz, LeMay, and Kenney, found themselves in a situation reminiscent of the interwar period. At that time, they were trying to sell the American public on the Air Corps and aviation in general. However, in the postwar period they had to sell the American public the role of aviation and the Air Force in national defense. In *Safety as a Factor in the Future of Aviation*, the authors made the point that there was a direct link between safety in aviation and national defense noting:

The sound development of civil aviation is therefore a primary concern from the military standpoint. It is also an objective which the wartime military experience can advantageously promote. . . . Achievement of greater flying safety, therefore, is a problem of primary importance. The experience and resourcefulness of all aviation interests are required for its solution.<sup>1130</sup>

The report also reminded the reader that:

---

<sup>1130</sup> Ibid., 1.

In military aviation, strict standards have been established for flying personnel, including physical qualifications, technical knowledge, and flying skill. In addition, considerable emphasis has been placed on the maintenance of proficiency.<sup>1131</sup>

Throughout the report, the Army Air Forces wartime experience is emphasized as the driving force for the implementation of those “strict standards.” Only vaguely implied is the notion that those standards may not have been in place or strictly enforced before the war.

Enforcement of those standards would result in a change in the Air Force culture. As an equal member of the armed forces the Air Force had to present a more professional outlook. And the Air Force set out to change the image of the pilot from the “swashbuckling, irresponsible” pilot before the war to the sober professional with peace as his profession.<sup>1132</sup> However, the change was not always met with acceptance by the pilots and some bemoaned what they believed the Air Force had lost. As one former pilot noted in the introduction to Charles Watry’s book: “To me, the Air Force. . . hasn’t permitted the truly outstanding leaders to move upward, promotion being given to those with flying safety record and political yes-men, who couldn’t lead anyone to the latrine, let alone in combat.” Regardless of the reason for the change the culture of the Air Force did change and that change was the direct result of the Army Air Forces wartime experience with accidents and fatalities.

---

<sup>1131</sup> Ibid., 35.

<sup>1132</sup> Some of the success of this effort can be seen in the movie *Dr. Strangelove*. The character of the B-52 pilot, Major Kong, even though he is a cowboy he is also portrayed as a determined professional as he considers his list of options as the mission begins to go wrong.

# **Bibliography**

## **Archival Sources**

Arnold Papers.

Air Force Historical Research Agency Collection, Maxwell AFB.

Box 4 Call No. 287.86-9

Box 6 Call No. 220.16302

Box 8 Call No. K239.0512-1674

Box 10 Call No. 259.01

Box 11 Call No. 422.607

Box 16 Call No. 520.056

Box 28 Call No. 259.04-1

Box 30 Call No. 248.262

Box 41 Call No. 359.3-5

Box 43 Call No. 450.6072

Box 44 Call No. 232.10536

Box 50 Call No. 232.10500

### Microfiche

Reel 33623

Reel 34396

Reel 35759

Reel 35978

Reel 43806

Reel K2345

The Library of Congress, Washington DC.

The Woman's Collection, Texas Women's University, Denton TX.

General Paul Tibbets interview by Dawn Letson, Women AirForce Service Pilots Oral History Report, 24 February 1997.

Women AirForce Service Pilots Letters, 1943 – 1944.

Wilbur and Orville Wright Papers.

### **United States Air Force Oral History Program**

Donovan, Stanley J. *Interview by Hugh N. Ahmann*. Arlington VA: USAF Oral History Program, 24 October 1985.

McKee, Seth J. *Interview by James C. Hasdorff*. Litchfield AZ: USAF Oral History Program, 13-15 February 1978.

McNickle, Marvin L. Arlington VA: USAF Oral History Program, 21 October 1985.

Miller, David V. *Interview by James C. Hasdorff*. Albuquerque NM: USAF Oral History Program, 20 September 1985.

Parrish, Noel F. USAF Oral History Program, 10-14 June 1974.

Terry, Roy M. *Interview by COL Richard H. Thomas*. Melbourne Beach FL: USAF Oral History Program, 17 April 1978.

Weyland, O. P. interview, USAF Oral History Program, 23 July 1974.

### **Government Documents**

*1st Air Force. That You May Live: 1st Air Force Safety Bulletin. Vol. February. Mitchell Field NY: United States Army Air Forces, 1945.*

———. *That You May Live: 1st Air Force Safety Bulletin. Vol. June. Mitchell Field NY: United States Army Air Forces, 1945.*

———. *That You May Live: 1st Air Force Safety Bulletin. Vol. March. Mitchell Field NY: United States Army Air Forces, 1945.*

*2nd Air Force. Second Air Force Flight Training Directive for Combat Crews. Colorado Springs CO: United States Army Air Forces, 1943.*

*Aviation Cadet Regulations*. Randolph Field TX: Gulf Coast Army Air Forces Training Center, 1 August 1942.

*Daily Diary, AC/AS, Training, Physical Training Division*. Washington DC: Headquarters, Army Air Forces, 9 August thru 3 December 1943.

*Historical Reference Paper: Major Changes in Undergraduate Pilot Training, 1939-1987*. Washington DC: Air Training Command, 1987.

Chief, Medical Division to Chief of Training and Organization Division. *Training Period in Reception Centers for Cadets*, 29 August 1941.

Cochran, Jacqueline. *Final Report on Women Pilot Program from Director of Women Pilots to Commanding General, Army Air Forces*. Washington DC: Headquarters, Army Air Forces, 1 June 1945.

Colonel E. B. Lyon, Commanding Officer, Moffett Field, CA to Lieutenant Colonel H. A. Johnson, Chief, Training Division, Chief of Air Corps. *Proposed Changes in Flying Training Curriculum* 26 February 1941.

Colonel E. B. Lyon, Commanding Officer, Air Corps Flying School, Moffett Field, CA. *Proposed Change in Flying Curriculum*, edited by H.A Johnson, Chief, Training Section Office Chief of the Air Corps May 21, 1941.

Medical Safety Division. *Accident Bulletin for Medical Investigators*. Feb ed. Vol. 2. Washington DC: United States Army Air Forces, 1945.

———. *Accident Bulletin for Medical Investigators*. Vol. 3. Washington DC: United States Army Air Forces, 1946.

Memorandum for Major General Henry H. Arnold. *Advancement of Elementary Students on a Proficiency Basis* 28 August 1941.

*Memorandum on Training Program*. Washington DC: Unknown, 1941.

*Pilots' Information File*. 15th ed. Washington DC: Headquarters, Army Air Forces, 1 May 1944.

United States Army Air Forces. Training Command. *Primary Flying: Instructors Manual*. Fort Worth TX: US GPO, 1944.

———. *Primary Flying; Students' Manual*. Fort Worth TX: 1944.

United States Army Air Forces and Henry Harley Arnold. *Report of the Commanding General of the Army Air Forces to the Secretary of War*. Washington DC: US GPO, 1944.

War Department. *AAF Regulation no. 16-14 Reporting and Investigation of Aircraft Accidents*. Washington DC: Headquarters Army Air Forces, May 26, 1942.

### Government Publications

Ashcroft, Bruce A. *We Wanted Wings: A History of the Aviation Cadet Program*. Randolph AFB TX: HQ AETC Office of History and Research, 2005.

Benton, Jeffery C. *They Served Here: Thirty-Three Maxwell Men*. Maxwell AFB AL: Air University Press, 1999.

Cameron, Rebecca Hancock. *Training to Fly: Military Flight Training, 1907-1945*. Washington DC: Air Force History and Museums Programs, 1999.

Copp, DeWitt S. and Air Force History and Museums Program. *Frank M. Andrews: Marshall's Airman*. Commemorative ed. Washington DC: Air Force History and Museums Program, 2003.

Craven, Wesley Frank, James Lea Cate. *The Army Air Forces in World War II*. Washington DC: Office of Air Force History, 1983; 1948.

Davis, Frederick B. *The AAF Qualifying Examination*. Army Air Forces Aviation Psychology Program Research Reports. Vol. Report No. 6. Washington DC: US GPO, 1947.

Ennels, Jerome A. *A Brief History of Gunter Air Force Station, 1940-1980*. Maxwell AFB AL: Office of History, Air University, 1981.

Frisbee, John L. and United States. Air Force. Office of Air Force History. *Makers of the United States Air Force*. USAF Warrior Studies. Washington DC: Office of Air Force History, U.S. Air Force, 1987.

Gabel, Christopher R. and James H. Willbanks, eds. *Great Commanders*. Fort Leavenworth, KS: US Army Combined Arms Center, 2012.

Griffith, Charles. *The Quest: Haywood Hansell and American Strategic Bombing in World War II*. Maxwell AFB AL: Air University Press, 1999.

Hansell, Haywood S. *The Strategic Air War Against Germany and Japan: A Memoir*. USAF Warrior Studies. Washington DC: Office of Air Force History, U.S. Air Force, 1986.

Hennessy, Juliette A. *The United States Army Air Arm, April 1861 to April 1917*. General Histories. Washington DC: Office of Air Force History, U.S. Air Force, 1985.



- Hines, Jay E. *History of Foreign Training in ATC, 1941-1976*. Randolph AFB, TX: History and Research Division, Office of the Chief of Staff,
- Holley, I. B. *Ideas and Weapons*. Washington DC: Air Force History and Museums Program, 1997 [1953].
- Kenney, George C. *General Kenney Reports: A Personal History of the Pacific War*. USAF Warrior Studies. Washington DC: Office of Air Force History, U.S. Air Force, 1987 [1949].
- LeMay, Curtis E., Richard H. Kohn, Joseph P. Harahan. *Strategic Air Warfare: An Interview with Generals Curtis E. LeMay, Leon W. Johnson, David A. Burchinal, and Jack J. Catton*. USAF Warrior Studies. Washington DC: Office of Air Force History, U.S. Air Force, 1988.
- MacGregor, Morris J. *Integration of the Armed Forces, 1940-1965*. Defense Studies Series. Washington DC: Center of Military History, U.S. Army, US GPO, 1981.
- Major Changes in Undergraduate Pilot Training, 1939-1979*. Maxwell AFB AL: History and Research Division, Air Training Command, 1980.
- Manning, Thomas A. *History of Air Education and Training Command, 1942-2002*. Randolph Air Force Base, TX: Office of History and Research, Headquarters, Air Education and Training Command, 2005.
- Manning, Thomas A. *History of Air Training Command, 1943-1993*. Randolph Air Force Base, TX: Office of History and Research, Headquarters, Air Education and Training Command, 1993.
- Maurer, Maurer. *Aviation in the U.S. Army, 1919-1939*. General Histories. Washington DC: Office of Air Force History, U.S. Air Force, 1987.
- . *The U.S. Air Service in World War I*. Maxwell AFB AL; Washington: Albert F. Simpson Historical Research Center; Supt. of Docs., US GPO, 1978; 1979.
- Meilinger, Phillip S. *American Airpower Biography: A Survey of the Field*. Maxwell AFB AL: Air University Press, 1995.
- Miller, Samuel Duncan and Mary Ann Cresswell. *An Aerospace Bibliography*. Reference Series, Office of Air Force History, U.S. Air Force. Washington DC: Office of Air Force History, U.S. Air Force, 1986.
- Nalty, Bernard C. *Winged Shield, Winged Sword: A History of the United States Air Force*. Washington DC: Air Force History and Museums Program, United States Air Force: US GPO, 1997.

Nalty, Bernard C., John F. Shiner, George M. Watson, and Alfred M. Beck. *With Courage: The U.S. Army Air Forces in World War II*. Washington DC: Air Force History & Museums Program, 1994.

Nickle, Barry H., *Contract Flying Training in Air Training Command, 1939-1980*. Maxwell AFB AL: History and Research Division, Air Training Command, 1981.

———. *Major Changes in Undergraduate Navigator Training, 1940-1980*. Maxwell AFB AL: History and Research Division, Air Training Command, 1981.

Osur, Alan M. *Blacks in the Army Air Forces during World War II: The Problems of Race Relations*. Special Studies, Office of Air Force History, United States Air Force. Washington DC: Office of Air Force History, United States Air Force, 1986 [1976].

Strickland, Patricia. *The Putt-Putt Air Force: The Story of the Civilian Pilot Training Program and the Wartime Training Service (1939-1944)*. Vol. GA-20-84. Washington DC: Federal Aviation Administration, 1971.

Tate, James P. *The Army and its Air Corps: Army Policy Toward Aviation, 1919-1941*. Maxwell AFB AL; Washington DC: Air University Press, 1998.

United States Army Air Forces. *Accident Facts: U.S Army Air Forces*. Winston-Salem NC: The Flight Control Command, 1943.

———. *Army Air Forces Historical Study no 2: Initial Selection of Candidates for Pilot, Bombardier and Navigator Training*. Maxwell AFB AL: United States Army Air Forces Historical Division, 1943.

———. *Army Air Forces Historical Study no. 5: Individual Training of Bombardiers*. Maxwell AFB AL: United States Army Air Forces, Historical Division, May 1944.

———. *Army Air Forces Historical Study no 15: Procurement of Aircrew Trainees*. Maxwell AFB AL: US Army Air Forces, 1944.

———. *Army Air Forces Historical Study, no 18: Pilot Transition to Combat Aircraft*. Maxwell AFB AL: United States Army Air Forces Historical Division, 1944.

———. *Army Air Forces Historical Study no. 27: Individual Training of Navigators in the AAF*. Maxwell AFB AL: United States Army Air Forces Historical Division, January 1945.

———. *Army Air Forces Historical Study no 31: Flexible Gunnery Training in the AAF*. Maxwell AFB AL: United States Army Air Forces Historical Division, 1945.

———. *Army Air Forces Historical Study no. 48: Preflight Training in the AAF, 1939-1944*. Maxwell AFB AL: United States Army Air Forces Historical Division, November 1946.

- . *Army Air Forces Historical Study no 61: Combat Crew and Unit Training in AAF, 1939-1945*. Maxwell AFB AL: Air Historical Office, Department of the Air Force, 1949.
- . *History of Flight Training Command, 1 July 1941-17 April 1943*. Washington DC: Headquarters, United States Army Air Forces, 1943.
- . *History of the Army Air Forces Pilot School (Specialized VHB) Randolph Field, Texas, Eighth Bimonthly Supplement, 1 May 1945-1 July 1945*. Randolph Field TX: Office of the Historical Editor, Army Air Forces Pilot School, 1945.
- . *Training of Foreign Nationals by the AAF, 1939-1945, Army Air Forces Historical Studies no. 64*. Maxwell AFB AL: Air Historical Office, 1947.
- . *Wings for Combat; the Story of the Training of an Air Force*. Fort Worth TX: Army Air Forces Training Command, Headquarters, 1943.
- US Air Force Historical Division. *US Air Force Historical Study no 11: Personnel Problems Relating to AAF Commissioned Officers, 1939-1945*. Maxwell AFB AL: USAF Historical Division, 1951.
- . *U. S. Air Force Historical Study no. 93: Development of AAF and USAF Training Concepts and Programs, 1941-1952*. Maxwell AFB AL: USAF Air University, 1953.
- United States Air Force Medical Service, Mae Mills Link, and Hubert Anderson Coleman. *Medical Support of the Army Air Forces in World War II*. Washington DC: Office of the Surgeon General, USAF, 1955.
- United States Army Air Forces. Office of the Air Surgeon. *Stanines: Selection and Classification for Air Crew Duty*. Washington DC: 1946.
- United States Army Air Forces. Office of Flying Safety. *Safety as a Factor in the Future of Aviation*. Washington DC: Chamber of Commerce of the United States of America, 1946.
- United States Army Air Forces. Office of Statistical Control. *Army Air Forces Statistical Digest: World War II*. Washington DC: Office of Statistical Control, 1945.
- Watson, George M. *General James H. Doolittle: The Air Force's Warrior-Scholar*. Air Force Sixtieth Anniversary Commemorative ed. Washington DC: Air Force History and Museums Program, 2008.
- Watson, Mark Skinner. *Chief of Staff: Prewar Plans and Preparations*. United States Army in World War II. Washington DC: Historical Division, Dept. of the Army, 1950.

## Books

- Ardery, Philip. *Bomber Pilot: A Memoir of World War II*. Lexington KY: University Press of Kentucky, 1978.
- Army and Navy Publishing Company of Louisiana. *Army Air Forces Training Command*. Barksdale Field. Baton Rouge, LA: Army & Navy Publishing Co., 1947.
- Arnold, Henry Harley. *Global Mission*. London: Hutchinson, 1951.
- . *Global Mission*. Military Classics Series. Blue Ridge Summit PA: Tab Books, 1989 [1949].
- Arnold, Henry Harley and Ira Clarence Eaker. *This Flying Game*. 3d ed. New York, London: Funk & Wagnalls Company, 1943.
- Arnold, Henry Harley and John W. Huston. *American Airpower Comes of Age: General Henry H. "Hap" Arnold's World War II Diaries*. Maxwell AFB AL: Air University Press, 2002.
- Berger, Bob. *Beating Murphy's Law: The Amazing Science of Risk*. New York: Delta, 1994.
- Bergerud, Eric M. *Fire in the Sky*. Boulder CO: Westview Press, 2000.
- Bernstein, Peter L. *Against the Gods: The Remarkable Story of Risk*. New York: John Wiley & Sons, 1996.
- Bérubé, Alan, *Coming Out Under Fire: The History of Gay Men and Women in World War Two*. New York: The Free Press, 1990.
- Bowman, Martin W. *The USAAF Handbook 1939-1945*. Mechanicsburg PA: Stackpole Books, 1997.
- Boyne, Walter J. *Clash of Wings: Air Power in World War II*. New York: Simon & Schuster, 1994.
- Browne, Ray B. *Rituals and Ceremonies in Popular Culture*. Bowling Green OH: Bowling Green University Popular Press, 1980.
- Coffey, Thomas M. *Hap: The Story of the U.S. Air Force and the Man Who Built it: General Henry H. "Hap" Arnold*. New York: Viking Press, 1982.
- . *Iron Eagle: The Turbulent Life of General Curtis LeMay*. 1st ed. New York: Crown Publishers, 1986.
- Colwell, James L. "Wings Over West Texas: Pecos Army Air Field in World War II." *West Texas Historical Association Yearbook* 63 (1987).

- Copp, DeWitt S. *A Few Great Captains: The Men and Events that Shaped the Development of U.S. Air Power*. McLean VA: EPM Publications, 1989 [1980].
- . *Forged in Fire: Strategy and Decisions in the Air War Over Europe, 1940-45*. 1st ed. Garden City NY: Doubleday, 1982.
- Craft, Stephen G. *Embry-Riddle at War: Aviation Training during World War II*. The Florida History and Culture Series. Gainesville FL: University Press of Florida, 2009.
- Daso, Dik A. *Hap Arnold and the Evolution of American Airpower*. Smithsonian History of Aviation Series. Washington DC: Smithsonian Institution Press, 2000.
- Davis, James M. and David L. Snead. *In Hostile Skies: An American B-24 Pilot in World War II*. North Texas Military Biography and Memoir Series. Vol. 3. Denton TX: University of North Texas Press, 2006.
- Douglas, Ann. *Terrible Honesty: Mongrel Manhattan in the 1920s*. 1st ed. New York: Farrar, Straus, and Giroux, 1995.
- Douglas, Deborah G. and Amy E. Foster. *American Women and Flight since 1940*. Lexington KY: University Press of Kentucky, 2004.
- Douglas, Mary and Aaron B. Wildavsky. *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers*. Berkeley CA: University of California Press, 1982.
- Dryden, Charles W. *A-Train: Memoirs of a Tuskegee Airman*. Tuscaloosa AL: University of Alabama Press, 1997.
- Farberow, Norman L. *The Many Faces of Suicide: Indirect Self-Destructive Behavior*. New York: McGraw-Hill, 1980.
- Fletcher, Eugene. *Mister: The Training of an Aviation Cadet in World War II*. Seattle WA: University of Washington Press, 1992.
- Goebel, Robert J. *Mustang Ace: Memoirs of a P-51 Fighter Pilot*. 1st ed. St. Paul MN: Zenith Press, 1991.
- Goldstein, Arnold P. *Violence in America: Lessons on Understanding the Aggression in our Lives*. 1st ed. Palo Alto CA: Davies-Black Pub., 1996.
- Graham, Frederick P. and Harold W. Kulick. *He's in the Air Corps Now*. 1st ed. New York: R.M. McBride & Co., 1942.
- Greenfield, Kent Roberts. *American Strategy in World War II: A Reconsideration*. Westport CT: Greenwood Press, 1979.

- Hansell, Haywood S. *The Air Plan that Defeated Hitler*. New York: Arno Press, 1980.
- Harmon, Thomas Dudley. *Pilots also Pray*. New York: Crowell, 1944.
- Hastings, Donald W., David G. Wright, Bernard C. Glueck. *Psychiatric Experiences of the Eighth Air Force: First Year of Combat (July 4, 1942-July 4, 1943)*. New York, NY: Prepared and distributed for the Air Surgeon, Army Air Forces by the Josiah Macy, Jr. Foundation, 1944.
- Hillenbrand, Laura. *Unbroken: A World War II Story of Survival, Resilience, and Redemption*. 1st ed. New York: Random House, 2010.
- Hirschhorn, Larry. *Beyond Mechanization: Work and Technology in a Postindustrial Age*. Cambridge MA: MIT Press, 1984.
- Hirschhorn, Larry and Carole K. Barnett. *The Psychodynamics of Organizations*. Labor and Social Change. Philadelphia PA: Temple University Press, 1993.
- Hodgson, Marion Stegemen. *Winning My Wings: A Woman Air Force Service Pilot in World War II*. Annapolis MD: Naval Institute Press, 1996.
- Hofstede, Geert H. and Gert Jan Hofstede. *Cultures and Organizations: Software of the Mind*. Rev 2 ed. New York: McGraw-Hill, 2005.
- Hoppes, Joanna Doolittle. *Calculated Risk: The Extraordinary Life of Jimmy Doolittle, Aviation Pioneer and World War II Hero*. Santa Monica CA: Santa Monica Press, 2004.
- Hynes, Samuel Lynn. *Flights of Passage: Reflections of a World War II Aviator*. New York; Annapolis MD: F.C. Beil; Naval Institute Press, 1988.
- Jablonski, Edward. *Airwar (4 Vols.)*. 1st ed. Garden City NY: Doubleday, 1971.
- . *Flying Fortress: The Illustrated Biography of the B-17s and the Men Who Flew Them*. Garden City NY: Doubleday, 1965.
- Jackson, Robert. *Infamous Aircraft: Dangerous Designs and their Vices*. Barnsley, U.K.: Pen & Sword Aviation, 2005.
- James, William and Robert D. Richardson. *The Heart of William James*. Cambridge MA: Belknap Press of Harvard University Press, 2010.
- Jernigan, A. Jack. *Selecting the Best: World War II Army Air Forces Aviation Psychology*. Rev ed. Bloomington IN: 1stBooks, 2003.
- Kahneman, Daniel, Paul Slovic, and Amos Tversky. *Judgment Under Uncertainty: Heuristics and Biases*. Cambridge: Cambridge University Press, 1982.

- Kates, Robert William, Christoph Hohenemser, and Jeanne X. Kaspersen. *Perilous Progress: Managing the Hazards of Technology*. Westview Special Studies in Science, Technology, and Public Policy. Boulder CO: Westview Press, 1985.
- Katz, Jack. *Seductions of Crime: Moral and Sensual Attractions in Doing Evil*. New York: Basic Books, 1988.
- Klausner, Samuel Z. *Why Man Takes Chances: Studies in Stress-Seeking*. 1st ed. Garden City NY: Anchor Books, 1968.
- Knerr, Hugh J. *The Student Pilot's Training Primer*. New York: D. Van Nostrand company, Inc., 1941.
- Kouwenhoven, John Atlee. *The Beer Can by the Highway: Essays on what's "American" about America*. Baltimore MD: Johns Hopkins University Press, 1988 [1961].
- Kozak, Warren. *LeMay: The Life and Wars of General Curtis LeMay*. Washington DC; New York: Regenary Pub.; Distributed by Perseus Distribution, 2009.
- Kuhn, Thomas S. *The Structure of Scientific Revolutions*. International Encyclopedia of Unified Science. Foundations of the Unity of Science, 2d ed. Chicago: University of Chicago Press, 1970.
- La Farge, Oliver. *The Eagle in the Egg*. New York: Arno Press, 1972 [1949].
- Lang, Kurt. *Military Institutions and the Sociology of War; A Review of the Literature with Annotated Bibliography*. Sage Series on Armed Forces and Society. Beverly Hills CA: Sage Publications, 1972.
- LeMay, Curtis E. and MacKinlay Kantor. *Mission with LeMay: My Story*. 1st ed. Garden City, NY: Doubleday, 1965.
- Lewis, Michael. *Boomerang: Travels in the New Third World*. 1st ed. New York: W.W. Norton & Co., 2011.
- Linton, Ralph. *The Study of Man: An Introduction*. The Century Social Science Series. Student's ed. New York: D. Appleton-Century Co, 1936.
- . *The Tree of Culture*. 1st ed. New York: Knopf, 1955.
- Lowrance, William W. *Of Acceptable Risk: Science and the Determination of Safety*. Los Altos CA: W. Kaufmann, 1976.
- . *Edgework: The Sociology of Risk Taking*. New York: Routledge, 2005.
- Martin, John Levi. *Social Structures*. Princeton NJ: Princeton University Press, 2009.

- McManus, John C. *Deadly Sky: The American Combat Airman in World War II*. Novato CA: Presidio, 2002 [2000].
- Mead, George Herbert. *On Social Psychology; Selected Papers*. The Heritage of Sociology. [Social psychology of George Herbert Mead]. Chicago IL: University of Chicago Press, 1964.
- Mead, George Herbert and Charles W. Morris. *Mind, Self and Society from the Standpoint of a Social Behaviorist*. Chicago IL: The University of Chicago press, 1934.
- Mead, Margaret. *And Keep Your Powder Dry; an Anthropologist Looks at America*. A new expanded ed. New York: Morrow, 1965.
- Meilinger, Phillip S. *Hoyt S. Vandenberg: The Life of a General*. Bloomington IN: Indiana University Press, 1989.
- Meilinger, Phillip S. *The Paths of Heaven: The Evolution of Airpower Theory*. Maxwell AFB AL: Air University Press, 1997.
- Mettler, Suzanne. *Soldiers to Citizens: The G.I. Bill and the Making of the Greatest Generation*. Oxford: Oxford University Press, 2005.
- Miller, Donald L. *Masters of the Air: America's Bomber Boys Who Fought the Air War Against Nazi Germany*. New York: Simon & Schuster, 2007.
- Mireles, Anthony J. *Fatal Army Air Forces Aviation Accidents in the United States, 1941-1945*. Jefferson NC: McFarland, 2006.
- Moye, J. Todd. *Freedom Flyers: The Tuskegee Airmen of World War II*. New York: Oxford University Press, 2012.
- Mrozek, Donald J. *Sport and American Mentality, 1880-1910*. Knoxville TN: The University of Tennessee Press, 1983.
- Nutter, Ralph H. *With the Possum and the Eagle: The Memoir of a Navigator's War Over Germany and Japan*. Novato CA: Presidio, 2002.
- Overy, R. J. *The Air War, 1939-1945*. New York: Stein and Day, 1980.
- Parton, James. *"Air Force Spoken Here": General Ira Eaker and the Command of the Air*. 1st ed. Bethesda MD: Adler & Adler, 1986.
- Perrow, Charles. *Complex Organizations: A Critical Essay*. 3rd ed. New York: Random House, 1986.
- . *Normal Accidents: Living with High-Risk Technologies*. New York: Basic Books, 1984.



- Pisano, Dominick. *To Fill the Skies with Pilots: The Civilian Pilot Training Program, 1939-46*. Urbana IL: University of Illinois Press, 1993.
- Primary Flight Training Program for U.S. Army Air Forces: Ryan School of Aeronautics, 5th AAFFTD, Hemet, CA, 11th AAFFTD, Tucson, Ariz.* San Diego CA: Ryan Aeronautical, 1943.
- Robertson, Gordon Bennett. *Bringing the Thunder: The Missions of a World War II B-29 Pilot in the Pacific*. Stackpole Military History Series. 1st ed. Mechanicsburg PA: Stackpole Books, 2006.
- Rodgers, Daniel T. *Atlantic Crossings: Social Politics in a Progressive Age*. Cambridge MA: Belknap Press of Harvard University Press, 1998.
- Sandler, Stanley. *Segregated Skies: All-Black Combat Squadrons of WW II*. Smithsonian History of Aviation Series. Washington DC: Smithsonian Institution, 1992.
- Scharr, Adela Riek. *Sisters in the Sky*. Gerald MO: Patrice Press, 1988.
- Short, James F. and Lee Ben Clarke. *Organizations, Uncertainties, and Risk*. Boulder CO: Westview Press, 1992.
- Skelton, Marvin L. *Memoirs of a World War II Pilot*. Military affairs/Aerospace Historian Instant Publishing Series. Manhattan KS: Military Affairs/Aerospace Historian, 1978.
- Smith, Lawrence S. *History of the 9th Bombardment Group (VH): 1st, 5th, and 99th Squadrons: As a B-29 Superfortress Unit in World War II: In Training at McCook AAF, Nebraska and in Combat as a Unit of the 313th Bombardment Wing on Tinian Island in the Marianas Under the XXI Bomber Command of the 20th Air Force United States Army Air Forces*. Princeton NJ: 9th Bomb Group Assn., 1995.
- Steinbeck, John. *Bombs Away: The Story of a Bomber Team*. Penguin Classics. 2nd ed. New York: Penguin Books, 2009.
- Stentiford, Barry M. *Tuskegee Airmen*. Landmarks of the American Mosaic. Santa Barbara CA: Greenwood, 2012.
- Stouffer, Samuel Andrew. *The American Soldier*. Studies in Social Psychology in World War II. Vol. 1-2. Princeton NJ: Princeton University Press, 1949.
- Taleb, Nassim. *The Black Swan: The Impact of the Highly Improbable*. New York: Random House Trade Paperbacks, 2010 [2007].
- The Official Guide to the Army Air Forces (AAF): A Directory, Almanac and Chronicle of Achievement*. New York: Simon and Schuster, 1944.

Thompson, Hunter S. *Fear and Loathing in Las Vegas: A Savage Journey to the Heart of the American Dream*. 1st Vintage Books ed. New York: Vintage Books, 1989 [1976].

———. *Hell's Angels: A Strange and Terrible Saga*. Modern Library ed. New York: Modern Library, 1999.

Watry, Charles A. *Washout!: The Aviation Cadet Story*. 1st ed. Carlsbad CA: California Aero Press, 1983.

Wells, Mark K. *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War*. Cass Series: Studies in Air Power. Essex, England: F. Cass, 1995.

Wildavsky, Aaron B. *Searching for Safety*. Studies in Social Philosophy & Policy. Vol. 10. New Brunswick, USA: Transaction Books, 1988.

Wolfe, Tom. *The Right Stuff*. New ed. New York: Farrar, Straus, Giroux, 1983.

Yeager, Chuck and Leo Janos. *Yeager, an Autobiography*. New York: Bantam Books, 1985.

### **Journals and Newspapers**

*New York Times*, 1900 – 2010.

"Informal Social Organization in the Army." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 365-370.

"The Making of the Infantryman." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 376-379.

Arms, Robert L., Gordon W. Russell, and Mark L. Sandilands. "Effects on the Hostility of Spectators of Viewing Aggressive Sports." *Social Psychology Quarterly* 42, no. 3 (Sep., 1979): pp. 275-279.

Booth, Alan, Douglas A. Granger, Allan Mazur, and Katie T. Kivlighan. "Testosterone and Social Behavior." *Social Forces* 85, no. 1 (Sep., 2006): pp. 167-191.

Brotz, Howard and Everett Wilson. "Characteristics of Military Society." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 371-375.

Clark, Robert A. "Aggressiveness and Military Training." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 423-432.

Clarke, Lee and James F. Short Jr. "Social Organization and Risk: Some Current Controversies." *Annual Review of Sociology* 19 (1993): pp. 375-399.

- Dierkes, Meinolf, Sam F. Edwards, Rob Coppock. "Technological Risk: Its Perception and Handling in the European Community." Publication of the Science Center Berlin. Vol. 23. Königstein im Taunus: Oelgeschlager, Gunn & Hain; Verlag Anton Hain, 1980.
- Donnelly, Peter. "'Take My Word for it: Trust in the Context of Birding and Mountaineering.'" *Qualitative Sociology* 17 (1994): 214-241.
- Elkin, Frederick. "The Soldier's Language." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 414-422.
- Elkin, Henry. "Aggressive and Erotic Tendencies in Army Life." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 408-413.
- Felson, Richard B. "Aggression as Impression Management." *Social Psychology* 41, no. 3 (Sep., 1978): pp. 205-213.
- Fine, Gary Alan and Lori Holyfield. "Secrecy, Trust, and Dangerous Leisure: Generating Group Cohesion in Voluntary Organizations." *Social Psychology Quarterly* 59, no. 1 (Mar., 1996): pp. 22-38.
- Franks, David D. and E. Doyle McCarthy. *The Sociology of Emotions: Original Essays and Research Papers*. Contemporary Studies in Sociology. Vol. 9. Greenwich, CT: Jai Press, 1989.
- Freudenburg, William R. "Risk and Recreancy: Weber, the Division of Labor, and the Rationality of Risk Perceptions." *Social Forces* 71, no. 4 (Jun., 1993): pp. 909-932.
- . "Social Impact Assessment." *Annual Review of Sociology* 12 (1986): pp. 451-478.
- Frisbee, John L. "On the Way to a Miracle." *Air Force Magazine* 65, no. 2 (1982): 75.
- . "Valor: AACMO - Fiasco or Victory." *Airforce-Magazine* 78, no. 3 (1995).
- Heimer, Carol A. "Social Structure, Psychology, and the Estimation of Risk." *Annual Review of Sociology* 14 (1988): pp. 491-519.
- Hollingshead, August B. "Adjustment to Military Life." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 439-447.
- Howard, Alan. "Interactional Psychology: Some Implications for Psychological Anthropology." *American Anthropologist* 84, no. 1 (Mar., 1982): pp. 37-57.
- Jones, Edgar. "'LMF': The use of Psychiatric Stigma in the Royal Air Force during the Second World War." *The Journal of Military History* 70, no. 2 (Apr., 2006): pp. 439-458.

- Lyng, Stephen. "Edgework: A Social Psychological Analysis of Voluntary Risk Taking." *American Journal of Sociology* 95, no. 4 (Jan., 1990): pp. 851-886.
- Lindesmith, Alfred R. "Teachers in the Army Air Forces." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 404-407.
- Lois, Jennifer. "Peaks and Valleys: The Gendered Emotional Culture of Edgework." *Gender and Society* 15, no. 3 (Jun., 2001): pp. 381-406.
- Manning, Peter K. "Managing Risk: Managing Uncertainty in the British Nuclear Installations Inspectorate." *Law & Policy* 11, no. 3 (1989): 350-369.
- Miller, Eleanor M. and Stephen Lyng. "Edgework Revisited: Reply to Miller." *American Journal of Sociology* 96, no. 6 (May, 1991): pp. 1534-1539.
- Rochlin, Gene I., Todd R. La Porte, and Karlene H. Roberts. "The Self-Designing High-Reliability Organization: Aircraft Carrier Flight Operations at Sea." *Naval War College Review* Autumn, no. 77 (1987): 76-90.
- Rose, Arnold. "The Social Structure of the Army." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 361-364.
- Snow, David A. and Leon Anderson. "Identity Work among the Homeless: The Verbal Construction and Avowal of Personal Identities." *American Journal of Sociology* 92, no. 6 (May, 1987): pp. 1336-1371.
- Spivey, Donald. *Sport in America: New Historical Perspectives*. Contributions to the Study of Popular Culture. Vol. 12. Westport CT: Greenwood Press, 1985.
- Stone, Robert C. "Status and Leadership in a Combat Fighter Squadron." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 388-394.
- Tierney, Kathleen J. "Toward a Critical Sociology of Risk." *Sociological Forum* 14, no. 2 (Jun., 1999): pp. 215-242.
- . "Toward a Critical Sociology of Risk." *Sociological Forum* 14, no. 2 (Jun., 1999): pp. 215-242.
- Wachtel, Sidney B. and Leo C. Fay. "Allocation of Grades in the Army Air Forces." *American Journal of Sociology* 51, no. 5, Human Behavior in Military Society (Mar., 1946): pp. 395-403.
- Watts, Meredith W. and David Sumi. "Studies in the Physiological Component of Aggression-Related Social Attitudes." *American Journal of Political Science* 23, no. 3 (Aug., 1979): pp. 528-558.

Wiener, Willard. *Two Hundred Thousand Flyers, the Story of the Civilian AAF Pilot Training Program*. Washington: The Infantry Journal, 1945.

### **Other**

Magee, John Gillespie, 1922-1941. *High Flight*. San Francisco: The Windsor press, 1943.

## Appendix A - Tables

Type of aircraft	Dec 1941	Dec 1942	Dec 1943	Dec 1944	Aug 1945	Maximum on Hand
Combat Aircraft	4,477	11,607	27,448	41,961	41,163	May 1945 (43,248)
Very Heavy Bombers	-	3	91	977	2,865	August 1945 (2,865)
Heavy Bombers	288	2,076	8,027	12,813	11,065	April 1945 (12,919)
Medium Bombers	745	2,556	4,370	6,189	5,384	October 1944 (6,262)
Light Bombers	799	1,201	2,371	2,980	3,079	September 1944 (3,338)
Fighters	2,170	5,303	11,875	17,198	16,799	May 1945 (17,725)
Reconnaissance	475	468	714	1,804	1,971	May 1945 (2,009)
Support Aircraft	7,820	21,697	36,784	30,765	22,552	July 1944 (41,667)
Transports	254	1,857	6,466	10,456	9,561	December 1944 (10,456)
Trainers	7,340	17,044	26,051	17,060	9,558	May 1944 (27,923)
Communications	226	2,796	4,267	3,249	3,433	December 1943 (4,267)
<b>Total</b>	<b>12,297</b>	<b>33,304</b>	<b>64,232</b>	<b>72,726</b>	<b>63,715</b>	<b>July 1944 (79,908)</b>

Table 1. Aircraft Production by Type and Year

(Source: US Army Air Forces Statistical Digest)

<b>Year</b>	<b>Number</b>	<b>Percent of US Army Strength</b>
<b>1930</b>	<b>13,305</b>	<b>9.7</b>
<b>1931</b>	<b>14,425</b>	<b>10.4</b>
<b>1932</b>	<b>14,650</b>	<b>11.0</b>
<b>1933</b>	<b>14,817</b>	<b>11.0</b>
<b>1934</b>	<b>15,621</b>	<b>11.4</b>
<b>1935</b>	<b>15,945</b>	<b>11.6</b>
<b>1936</b>	<b>16,863</b>	<b>10.2</b>
<b>1937</b>	<b>18,572</b>	<b>10.4</b>
<b>1938</b>	<b>20,196</b>	<b>11.0</b>
<b>1939</b>	<b>22,387</b>	<b>11.9</b>
<b>1940</b>	<b>51,185</b>	<b>19.3</b>
<b>1941</b>	<b>152,125</b>	<b>10.5</b>
<b>1942</b>	<b>764,415</b>	<b>23.2</b>
<b>1943</b>	<b>2,197,114</b>	<b>31.4</b>
<b>1944</b>	<b>2,372,292</b>	<b>31.0</b>
<b>1945</b>	<b>2,282,259</b>	<b>27.6</b>

Table 2. AAF Military Personnel — Number and Percent of US Army Strength: 1930 – 1945

(Source: USAAF Statistical Digest – World War II)

Type of facility	7 Dec 41	31 Dec 41	31 Dec 42	31 Dec 43	31 Dec 44	31 Aug 45
Main bases	114	151	345	345	377	344
Satellite bases	-	-	71	116	37	57
Auxiliary fields	-	-	198	322	309	269
Bombing & Gunnery Ranges	-	-	Unknown	-	480	433
Contract Pilot Training schools	Unknown	Unknown	69	66	14	6
Civilian & Factory Technical Schools	-	-	66	47	21	16
College Training Detachments	-	-	16	234	2	1
<b>Total Installations</b>	<b>114</b>	<b>151</b>	<b>765</b>	<b>1,130</b>	<b>1,240</b>	<b>1,126</b>

Table 3. US Army Air Forces Training Facilities by Function and Year

(Source: US Army Air Forces Statistical Digest)



Year	All Accidents		Fatal Accidents		Fatalities		Aircraft Wrecked	
	Number	Rate*	Number	Rate	Number	Rate	Number	Rate
1936	430	83	42	8	59	11	113	22
1937	358	69	27	5	48	9	87	17
1938	375	63	38	6	62	10	80	13
1939	389	53	32	4	52	7	86	12
1940	478	51	46	5	90	10	100	11
1941	1,304	58	116	5	199	9	228	10
1942	5,612	74	582	8	1,096	14	1,259	17
1943	15,632	70	1,779	8	4,209	19	3,854	17
1944	20,883	54	2,272	6	5,616	14	5,387	14
1945	10,798	42	1,378	5	3,779	15	3,624	13

Table 4. Aircraft Accidents — Number and Rate: Fiscal Year 1936 – 1945

\* Rates are per 100,000 flying hours.

(Source: US Army Air Forces Statistical Digest)

	<b>Primary Trainer</b>	<b>Basic Trainer</b>	<b>Advanced Trainer</b>
<b>All Accidents: Number</b>	<b>8,256</b>	<b>4,881</b>	<b>13,511</b>
<b>Rate*</b>	<b>48</b>	<b>27</b>	<b>55</b>
<b>Fatal Accidents</b>	<b>333</b>	<b>825</b>	<b>943</b>
<b>Fatalities</b>	<b>439</b>	<b>1,175</b>	<b>1,888</b>
<b>Airplanes Wrecked</b>	<b>1,032</b>	<b>1,558</b>	<b>2,227</b>

Table 5. Airplane Accidents in Flight Training

\* Rates are per 100,000 flying hours.

(Source: US Army Air Forces Statistical Digest)

	<b>B-17</b>	<b>B-24</b>	<b>B-25</b>	<b>B-26</b>	<b>B-29</b>	<b>P-38</b>	<b>P-47</b>	<b>P-51</b>
<b>All Accidents: Number</b>	<b>1,589</b>	<b>1,713</b>	<b>921</b>	<b>739</b>	<b>272</b>	<b>1,403</b>	<b>3,049</b>	<b>824</b>
<b>Rate*</b>	<b>30</b>	<b>35</b>	<b>33</b>	<b>55</b>	<b>40</b>	<b>139</b>	<b>127</b>	<b>105</b>
<b>Fatal Accidents</b>	<b>284</b>	<b>490</b>	<b>233</b>	<b>223</b>	<b>63</b>	<b>337</b>	<b>404</b>	<b>131</b>
<b>Fatalities</b>	<b>1,757</b>	<b>2,796</b>	<b>936</b>	<b>993</b>	<b>461</b>	<b>379</b>	<b>435</b>	<b>137</b>
<b>Airplanes Wrecked</b>	<b>479</b>	<b>746</b>	<b>446</b>	<b>408</b>	<b>119</b>	<b>758</b>	<b>1,125</b>	<b>338</b>

Table 6. Airplane Accidents in Transition Flight Training: 1942 – 1945 (primary models only).

\* Rates are per 100,000 flying hours.

(Source: US Army Air Forces Statistical Digest)