

THE LOST ART OF AIR SUPERIORITY:
US PURSUIT AVIATION, 1919 TO 1941

BY
ANDREW R. BRABSON

A THESIS PRESENTED TO THE FACULTY OF
THE SCHOOL OF ADVANCED AIR AND SPACE STUDIES
FOR COMPLETION OF GRADUATION REQUIREMENTS

SCHOOL OF ADVANCED AIR AND SPACE STUDIES
AIR UNIVERSITY
MAXWELL AIR FORCE BASE, ALABAMA
JUNE 2005

Distribution A: Approved for Public Release; Distribution is Unlimited
--

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JUN 2005		2. REPORT TYPE		3. DATES COVERED 00-00-2005 to 00-00-2005	
4. TITLE AND SUBTITLE The Lost Art of Air Superiority: US Pursuit Aviation, 1919 to 1941				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air University, School of Advanced Air and Space Studies, 325 Chennault Circle, Maxwell AFB, AL, 36112				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT see report					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 91	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

APPROVAL

THE UNDERSIGNED CERTIFY THAT THIS THESIS MEETS MASTERS-LEVEL STANDARDS OF RESEARCH, ARGUMENTATION, AND EXPRESSION.

COL THOMAS E. GRIFFITH (DATE)

LT COL JOHN G. TERINO (DATE)

DISCLAIMER

THE CONCLUSIONS AND OPINIONS EXPRESSED IN THIS DOCUMENT ARE THOSE OF THE AUTHOR. THEY DO NOT REFLECT THE OFFICIAL POSITION OF THE US GOVERNMENT, DEPARTMENT OF DEFENSE, THE UNITED STATES AIR FORCE, OR AIR UNIVERSITY.

ABOUT THE AUTHOR

MAJOR ANDREW R. BRABSON WAS COMMISSIONED THROUGH THE RESERVE OFFICER TRAINING CORPS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY IN 1989. GRADUATING FROM UNDERGRADUATE NAVIGATOR TRAINING IN 1991, HE WENT ON TO FLY THE F-15E AS A WEAPON SYSTEMS OFFICER AT SEYMOUR JOHNSON AFB, NORTH CAROLINA. IN 1994, HE TRANSITIONED TO PILOT TRAINING. GRADUATING FROM UNDERGRADUATE PILOT TRAINING IN 1995, HE WENT ON TO FLY THE F-15C AS AN INSTRUCTOR AND EVALUATOR PILOT IN GERMANY, IDAHO, AND FLORIDA. MAJOR BRABSON IS A SENIOR PILOT WITH MORE THAN 2,000 FLYING HOURS. HE HAS A BACHELOR'S AND MASTER'S DEGREE IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE FROM THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY AND A MASTER'S DEGREE FROM THE AIR COMMAND AND STAFF COLLEGE. IN JULY 2005, MAJOR BRABSON WAS ASSIGNED TO CENTCOM AS DIRECTOR OF COMBAT OPERATIONS IN THE COMBINED AIR OPERATIONS CENTER, AL UDEID, QATAR.

ACKNOWLEDGEMENTS

I WOULD LIKE TO ACKNOWLEDGE SEVERAL PEOPLE WHOSE HELP AND SUPPORT MADE THIS THESIS POSSIBLE. I WANT TO THANK COL THOMAS E. GRIFFITH FOR HIS INSIGHTFUL COMMENTS AND EDITING OF THE MANUSCRIPT. HIS TIRELESS DEVOTION AND GUIDANCE GREATLY ENHANCED THE PRODUCT.

I WOULD ALSO LIKE TO THANK LT COL JOHN G. TERINO FOR HIS ENCOURAGEMENT AND INVALUABLE DISCUSSIONS THAT OPENED NEW AREAS FOR EXPLORATION. ADDITIONALLY, HIS GUIDANCE ON INTERWAR AVIATION KEPT ME FOCUSED THROUGHOUT THE PROJECT.

IN ADDITION, I WOULD LIKE TO THANK PROFESSOR THOMAS HUGHES AND DR. DANIEL R. MORTENSEN WHOSE INSIGHTS INTO WORLD WAR II AVIATION HELPED FLESH OUT THE INTERACTION OF PURSUIT AVIATION DURING THE WAR.

FINALLY, I WOULD LIKE TO THANK MY WIFE LOIS AND DAUGHTERS TAMARA AND SKYE FOR THEIR LOVING SUPPORT AND UNDERSTANDING AS I DEDICATED NUMEROUS HOURS LOCKED AWAY IN THE STUDY COMPLETING THIS PAPER. I WILL PARTICULARLY REMEMBER THE NUMEROUS COOKIE BREAKS IMPOSED ON ME BY THREE GIRLS WITH AN ENDLESS SUPPLY OF ENERGY AND QUESTIONS.

ABSTRACT

THIS STUDY EXAMINES THE DEVELOPMENT OF US PURSUIT AVIATION DURING THE INTERWAR PERIOD, 1919 TO 1941. DURING THIS PERIOD, AIRMEN STRUGGLED TO DEVELOP A COHERENT AIRPOWER THEORY FROM THEIR EXPERIENCES IN WORLD WAR I. WITH ONLY ONE WAR TO BASE THEIR THEORIES UPON, AIRMEN BASED MUCH OF THEIR DEVELOPING THEORIES UPON SPECULATION. IN SOME WAYS THEIR THEORIES PROVED CORRECT, IN OTHERS, THEY MISSED THE TARGET. WORLD WAR II TESTED THEIR THEORIES AND QUICKLY HIGHLIGHTED THE SHORTCOMINGS OF INTERWAR US AIRPOWER DOCTRINE. PURSUIT AVIATION WAS ONE BRANCH OF US AIRPOWER WHERE AIRMEN HAD MISSED THE MARK.

US PURSUIT AVIATION ENTERED WORLD WAR II UNREADY TO COMPETE WITH THE OTHER MAJOR POWERS. ITS EQUIPMENT WAS SUBSTANDARD, ITS PILOTS WERE NOT TRAINED IN THE MISSIONS THEY WOULD EXECUTE, AND, MOST IMPORTANTLY, PURSUIT AVIATION LACKED A COHERENT THEORY ON GAINING AIR SUPERIORITY. WHY PURSUIT AVIATION FELL SHORT IS A GOOD QUESTION GIVEN THAT AT THE END OF WORLD WAR I, AIRMEN CONSIDERED PURSUIT THE FUNDAMENTAL ARM OF THE AIR FORCE.

PURSUIT'S DOWNFALL WAS INTERTWINED WITH THE RISE OF THE BOMBER. WHEN AIRMEN REALIZED THE AWESOME POTENTIAL OF STRATEGIC BOMBING, THEIR FOCUS, AND THE FOCUS OF THE AIR CORPS SHIFTED FROM PURSUIT TO BOMBARDMENT. NO LONGER WAS PURSUIT THE FUNDAMENTAL ARM OF THE AIR FORCE, INSTEAD AIRMEN RECOGNIZED PURSUIT AS A NECESSARY SUPPLEMENT TO BOMBARDMENT. IN THE EARLY 1930S, ADVANCES IN BOMBER TECHNOLOGY ENABLED BOMBERS TO OUT-RANGE AND OUT-PACE CONCURRENT FIGHTERS. THIS FURTHER DEGRADED THE ROLE OF PURSUIT, AS AIRMEN DEEMED PURSUIT NO LONGER NECESSARY FOR BOMBARDMENT'S SUCCESS. INSTEAD, THE AIR CORPS RELEGATED PURSUIT ONLY TO A DEFENSIVE ROLE AGAINST ENEMY BOMBARDMENT. PURSUIT MAINTAINED THAT ROLE UNTIL THE BUILD-UP FOR WORLD WAR II. DURING THE BUILDUP, AIR CORPS LEADERS REEVALUATED THE VALUE OF PURSUIT AS THEY WITNESSED THE AIR BATTLES BETWEEN MAJOR POWERS IN EUROPE AND THE PACIFIC. THEY AGREED THAT PURSUIT WAS MORE POTENT AGAINST BOMBARDMENT THAN MOST HAD THOUGHT IT WOULD BE. AS SUCH, PURSUIT BEGAN TO RECOVER AND BROADEN ITS MISSIONS OUTSIDE OF DEFENSIVE ROLES AS THE BUILD-UP CONTINUED.

UNFORTUNATELY, THE RECOVERY OCCURRED TOO LATE FOR PURSUIT TO RECOVER FULLY BEFORE WORLD WAR II. WHEN THE JAPANESE ATTACKED, US FIGHTER PERFORMANCE STILL LAGGED BEHIND THE PERFORMANCE OF JAPANESE, BRITISH, AND GERMAN FIGHTERS AND ITS PILOTS WERE NOT READY TO FLY ESCORT AND GROUND ATTACK MISSIONS. MOST DAMAGING, HOWEVER, TO US PURSUIT PERFORMANCE WAS AN INGRAINED CONCEPT THAT PURSUIT WAS PRIMARILY A DEFENSIVE FORCE. THAT PARADIGM CAUSED PURSUIT AIRMEN AND DOCTRINE TO IGNORE THE FIGHT FOR AIR SUPERIORITY. ONLY THROUGH THEIR EXPERIENCES IN WORLD WAR II DID PURSUIT PILOTS AND AIR FORCE LEADERS RECOGNIZE THE NEED FOR PURSUIT TO GAIN AIR SUPERIORITY BY ATTACKING OFFENSIVELY HOSTILE PURSUIT. THIS WAS A LESSON THE AIRMEN HAD LEARNED DURING WORLD WAR I BUT FORGOTTEN IN THE INTERWAR YEARS. THUS, THIS STUDY IS AN EXAMINATION OF DOCTRINE DEVELOPED, LOST, AND THEN RECOVERED.

CONTENTS

CHAPTER	PAGE
DISCLAIMER	iii
ABOUT THE AUTHOR	iv
ACKNOWLEDGMENTS	v
ABSTRACT	vi
INTRODUCTION	1
1 THE RISE AND FALL OF PURSUIT: 1919-1926	7
2 BATTLE WITH THE BOMBERS: 1926-1935	24
3 DEFENDING PURSUIT AVIATION: 1935-1939	51
4 PREPARATION FOR WAR: 1939-1941	70
5 PURSUIT AVIATION IN WORLD WAR II	81
CONCLUSION	118
BIBLIOGRAPHY	127

Introduction

THE CHIEF OF THE AIR CORPS FEELS THAT THE SUBJECT OF PURSUIT AVIATION – TACTICS AND PLANE DEVELOPMENT, HAS NOT RECEIVED THE SHARE OF ATTENTION AND INTEREST IN THE AIR CORPS WHICH IT MERITS AND THAT, CONSEQUENTLY, THIS PHASE OF MILITARY AVIATION HAS LAGGED BEHIND BOMBARDMENT.

*- MAJ GEN H. H. ARNOLD
14 NOVEMBER 1939*

AIRPLANES AND AIRPOWER FIRST ENTERED THE COMBAT ARENA ON A LARGE SCALE DURING WORLD WAR I. ALTHOUGH THE UNITED STATES PARTICIPATED IN ONLY THE FINAL YEAR OF THE AIR BATTLES, IT GAINED ENOUGH EXPERIENCE TO FLESH OUT THE PRIMARY ROLES OF MILITARY AVIATION. AFTER THE WAR, US AVIATORS ATTEMPTED TO UNDERSTAND HOW BEST TO EMPLOY AIRPOWER. WHILE THE LIKES OF “BOOM” TRENCHARD, GUILIO DOUHET AND BILLY MITCHELL HAVE A FAMILIAR RING TO MOST AVIATORS AS VISIONARIES FOR A NEW METHOD OF WAR ENABLED BY AIRPOWER, AVIATORS ACROSS THE BOARD ATTEMPTED TO DEVELOP AND CODIFY AIRPOWER THEORY.

AS US AVIATORS ASSESSED THE LESSONS OF WORLD WAR I, THEY STRUGGLED TO COUPLE THESE PAST EXPERIENCES WITH EMERGING TECHNOLOGIES TO DEVELOP A ROBUST THEORY OF AIRPOWER. IN SOME AREAS, AIRMEN SUCCEEDED, IN OTHERS THEY FAILED. ONE AREA WHERE AMERICAN AIRMEN FELL SHORT WAS IN PURSUIT AVIATION. THE DEVELOPMENT OF PURSUIT AVIATION BETWEEN WORLD WAR I AND WORLD WAR II THEREFORE SERVES AS A USEFUL CASE STUDY TO EXAMINE POTENTIAL PITFALLS IN THE DEVELOPMENT OF AIRPOWER THEORY AND DOCTRINE.

IN MANY RESPECTS, US AIRMEN WERE LESS SUCCESSFUL THAN THEIR FOREIGN COUNTERPARTS IN DEVELOPING PURSUIT AVIATION. AT THE START OF WORLD WAR II, AFTER 20 YEARS OF DEVELOPMENT, US PURSUIT AVIATION TRAILED CONTEMPORARY EUROPEAN AND ASIAN COUNTERPARTS IN BOTH DOCTRINE AND EQUIPMENT. AN EXCERPT FROM AN ANONYMOUS POST WORLD WAR II LECTURE SUMS UPS THE FEELINGS OF US AVIATORS WITH REGARD TO AMERICAN PURSUIT AIRCRAFT ENTERING WORLD WAR II. “AT THE BEGINNING OF THE WAR IN EUROPE OUR ONLY SO CALLED OPERATIONAL FIGHTER WAS THE P-40 TOMMY HAWK. ITS PRINCIPLE ARMAMENT WAS TWO .50 CALIBER SYNCHRONIZED GUNS. IT WAS 50 MILES PER HOUR SLOWER THAN THE BRITISH CONTEMPORARY, AND 100 MILES PER HOUR SLOWER THAN THE GERMAN; IT WAS HELPLESS OVER 12,000 FEET AND HAD AN ENGINE WHOSE OUTSTANDING CHARACTERISTIC WAS A FATAL TENDENCY TO QUIT.”¹ FURTHERMORE, MAJOR GENERAL ARNOLD’S ASSESSMENT AS CHIEF OF THE AIR CORPS CITED AT THE BEGINNING OF THIS CHAPTER HIGHLIGHTS THE OPINION WITHIN THE AIR CORPS PRIOR TO WORLD WAR II THAT US PURSUIT AVIATION HAD FALLEN BEHIND ITS BOMBARDMENT COUNTERPART. BUT WAS THIS IN FACT THE CASE?

Research Question

THIS PAPER TRACES THE DEVELOPMENT OF US ARMY AIR CORPS PURSUIT AVIATION DURING THE INTERWAR YEARS TO JUDGE WHETHER IT WAS USEFUL AND EFFECTIVE AT THE START OF WORLD WAR II. IN DOING SO, THIS STUDY SEEKS TO SHED LIGHT ON AN AREA THAT HAS NOT BEEN WELL STUDIED AND TO DRAW FORWARD LESSONS FOR THE MODERN DAY AVIATOR AS WELL.

IN THE INTERWAR YEARS, AIRMEN DESCRIBED PURSUIT AVIATION AS THE USE OF AIRCRAFT TO DEFEAT AIRBORNE ENEMY FORCES. THE 1926 WAR DEPARTMENT TRAINING REGULATION 440-15 DESCRIBES PURSUIT AVIATION’S MISSION. “THE ROLE OF PURSUIT AVIATION IS TO SEEK OUT AND ENGAGE HOSTILE AVIATION, DEFEAT OR NEUTRALIZE IT AND THUS SECURE FREEDOM OF ACTION FOR ALL AIR UNITS AS WELL AS TO PROTECT OUR GROUND FORCES FROM AERIAL ATTACK.”² IN 2005 VERBIAGE, PURSUIT AVIATION TRANSLATES INTO AIR-TO-AIR FIGHTER AVIATION AND THE COUNTERAIR MISSION. THIS THESIS

¹ “The Future Development in Fighter Aircraft,” lecture, 1947, US Air Force Historical Research Agency (AFHRA) 248.281-19.

² War Department Training Regulation No. 440-15, *Air Service: Fundamental Principles for the Employment of the Air Service*, 26 January 1926, 15.

USES THE TERMS FIGHTER AND PURSUIT INTERCHANGEABLY, EXCEPT WHERE A DISTINCT DIFFERENCE IN MEANING ARISES, TO DESCRIBE THE AIR-TO-AIR BRANCH OF AVIATION.

THE DEVELOPMENT OF PURSUIT AVIATION BETWEEN THE WARS HAS BEEN AN UNDERSTUDIED PORTION OF AIR FORCE HISTORY. ANY AIR FORCE OFFICER WHO HAS BEEN THROUGH SQUADRON OFFICER SCHOOL OR AIR COMMAND AND STAFF COLLEGE CAN DESCRIBE THE DEVELOPMENT OF BOMBARDMENT AVIATION. EACH COULD DESCRIBE THE GENESIS OF STRATEGIC BOMBING FROM THE EARLY THEORIES OF DOUHET AND MITCHELL, THROUGH ITS REFINEMENT IN THE AIR CORP TACTICAL SCHOOL'S INDUSTRIAL WEB THEORY, AND FINALLY TO ITS EXECUTION DURING THE STRATEGIC BOMBING CAMPAIGNS AGAINST GERMANY AND JAPAN. NEVERTHELESS, FEW AIR FORCE OFFICERS COULD DESCRIBE THE SIMULTANEOUS DEVELOPMENTS OF PURSUIT AVIATION OUTSIDE OF THE FAILURE TO DEVELOP AN ESCORT FIGHTER. THIS PAPER SEEKS TO FILL THE VOID SURROUNDING PURSUIT AVIATION'S DEVELOPMENT.

WHILE CLOSELY LINKED TO THE DEVELOPMENT OF STRATEGIC BOMBING THEORY, PURSUIT AVIATION'S DEVELOPMENT FOLLOWED ITS OWN PATH MARKED BY CONTROVERSY AND CONFLICT APPROACHING WORLD WAR II. BY STUDYING PURSUIT'S DEVELOPMENT ONE CAN GRASP WHERE PURSUIT AVIATION THEORY WAS ROBUST, LACKING, OR SIMPLY OVERLOOKED AND THEREFORE BETTER UNDERSTAND THE PREPARATION OF US PURSUIT AVIATION FOR WORLD WAR II.

Significance of Research

AT THE END OF WORLD WAR I, AIRPOWER DOCTRINE WAS IN A LARVAL STAGE. AVIATORS HAD EXPERIENCED AND WITNESSED THE EFFECTS OF AIRPOWER, YET THE BULK OF AIRPOWER DOCTRINE REMAINED UNEXPLORED. WHAT AVIATORS DID DISCOVER DURING THE GREAT WAR WAS THE VITAL IMPORTANCE OF AIR SUPERIORITY TO SUCCESSFUL GROUND AND AIR OPERATIONS. FURTHERMORE, THE BEST WAY TO ACHIEVE AIR SUPERIORITY WAS THROUGH PURSUIT AVIATION ATTACKING ENEMY FORCES IN THE AIR. HENCE, FROM A PILOT'S PERSPECTIVE AT THE END OF WORLD WAR I, PURSUIT AVIATION WAS THE BASIC AND MOST IMPORTANT ARM OF THE AIR SERVICE. HOWEVER, THE REIGN OF PURSUIT AVIATION WOULD NOT LAST. AS AVIATORS DEVELOPED DOCTRINE IN THE INTERWAR YEARS, THE IMPORTANCE OF PURSUIT AVIATION BEGAN TO DIMINISH. BOMBARDMENT REPLACED PURSUIT AVIATION AS THE FUNDAMENTAL ARM OF THE AIR CORPS AND PURSUIT TOOK A SECOND SEAT TO BOMBARDMENT.

BY THE ONSET OF WORLD WAR II, THE IMPORTANCE OF PURSUIT AVIATION HAD DIMINISHED TO THE POINT THAT SOME AIRMEN EVEN QUESTIONED ITS VERY NECESSARY. INDEED, SOME PILOTS EVEN SUGGESTED THAT AIR SUPERIORITY BATTLES FOUGHT BY PURSUIT FIGHTERS WERE A RELIC OF THE PAST.³ ALTHOUGH BUOYED BY THE MISSION OF CONTINENTAL DEFENSE, PURSUIT AVIATION TRAINING AND DOCTRINE, ESPECIALLY FOR OFFENSIVE AND EXPEDITIONARY OPERATIONS, WAS LACKING. ADDITIONALLY, FIGHTER TECHNOLOGY IN THE UNITED STATES TRAILED GERMAN, ENGLISH, AND JAPANESE TECHNOLOGIES. EVEN WITH TWO YEARS TO PREPARE ITS PURSUIT FORCES FROM 1939 TO 1941, THE UNITED STATES WOULD NOT FIELD A FIGHTER COMPARABLE TO THAT OF FOREIGN POWERS UNTIL ROUGHLY 1943. LIKEWISE, EXPENDABLE FUEL TANKS TO PROVIDE THE CAPABILITY TO ESCORT ITS BOMBERS INTO THE HEART OF GERMANY BECAME AVAILABLE IN ADEQUATE QUANTITIES ALMOST A YEAR LATER IN 1944. YET, THIS SAME TECHNOLOGY WAS OPERATIONAL ON JAPANESE FIGHTERS AS EARLY AS 1939 AND GERMAN FIGHTERS IN 1940.⁴

UNDERSTANDING WHY THE ONCE DOMINANT AIRPOWER MISSION OF PURSUIT AVIATION DECLINED DURING THE INTERWAR PERIOD IS CRITICAL TO ENSURING THAT IT DOES NOT HAPPEN AGAIN. TODAY, MUCH AS IN THE 1930S, AIR SUPERIORITY BATTLES SEEM OUTDATED. THE ADVENT OF STEALTH AIRCRAFT AND OTHER NEW TECHNOLOGIES COMBINED WITH THE RECENT AIR DOMINANCE DEMONSTRATED IN OPERATIONS ENDURING FREEDOM AND IRAQI FREEDOM HAVE CAUSED SOME TO QUESTION THE NEED TO

³ Lt Col H. H. Arnold, letter to the Chief of the Air Corps, subject: Employment of Tactical Units Equipped with Modern Pursuit and Bombardment Airplanes, 26 November 1934, 18, AFHRA 248.282-27.

⁴ Capt A. J. Kerwin Malone, "Pursuit Aviation in the Sino-Japanese War" (Maxwell Field, Ala.: thesis, Air Corps Tactical School, 1939), 9. AFHRA 248.282-28 and Richard Hough and Denis Richards, *Battle of Britain* (New York, N.Y.: W. W. Norton & Company, 1989), 298.

MAINTAIN A ROBUST AIR-TO-AIR CAPABILITY.⁵ YET TODAY, EVEN MORE THAN IN 1939, THE UNITED STATES RELIES UPON AIR SUPERIORITY TO EMPLOY EFFECTIVELY ITS ARMED FORCES. IN THIS REGARD, THE AIR FORCE CANNOT ALLOW SUCCESS TO BEGET COMPLACENCY. THE AIR FORCE AND THE NATION CANNOT AFFORD TO LOSE SIGHT OF THE REQUIREMENT TO MAINTAIN AND DEVELOP AIR-TO-AIR CAPABILITY, THEORY AND DOCTRINE. BY STUDYING THE DECLINE OF INTERWAR US PURSUIT AVIATION, THIS PAPER WILL HELP CLARIFY THE MEANS THROUGH WHICH THE AIR FORCE CAN MAINTAIN ITS AIR-TO-AIR DOMINANCE AND AVOID THE PITFALLS THAT BESET THE AIR CORPS.

Organization

THIS PAPER TRACES THE INTERWAR DEVELOPMENT OF PURSUIT AVIATION CHRONOLOGICALLY THROUGH THE FOUR HISTORIC PERIODS DESCRIBED IN THOMAS H. GREER'S *THE DEVELOPMENT OF AIR DOCTRINE IN THE ARMY AIR ARM 1917-1941*. ALTHOUGH PURSUIT DOCTRINE CHANGED GRADUALLY FROM WORLD WAR I TO WORLD WAR II, THE FOUR PERIODS USED BY GREER ARE APPROPRIATE BECAUSE THEY GENERALLY CORRESPOND WITH DISTINCT PHASES WITHIN PURSUIT AVIATION DEVELOPMENT. FURTHERMORE, THE GREER BREAKPOINTS MATCH ORGANIZATIONAL CHANGES WITHIN THE AIR SERVICE AND AIR CORPS THAT ALSO AFFECTED FIGHTER DEVELOPMENT.

THE FIRST SECTION TRACES THE AIR SERVICE YEARS FROM 1919 TO 1926. DURING THE AIR SERVICE YEARS, AVIATION SERVED PRIMARILY AS AN ADJUNCT TO GROUND OPERATIONS. THE AIR SERVICE STRUGGLED TO DETERMINE THE APPROPRIATE USE OF AIR POWER WHILE IT SIMULTANEOUSLY SUFFERED FROM MASSIVE FORCE REDUCTIONS. DURING THE AIR SERVICE YEARS, THE PURSUIT FIGHTER WAS THE CENTRAL FOCUS OF AIRPOWER DOCTRINE. THE SECOND SECTION COVERS THE AIR CORPS YEARS FROM 1926 TO 1935. THE AIR CORPS YEARS ARE MARKED BY A CAPITAL REINVESTMENT IN THE AIR CORPS AND THE DEVELOPMENT OF THE IDEA OF AN INDEPENDENT AIR FORCE OPERATING BEYOND THE REACH OF THE ARMY. FOR PURSUIT AVIATION, THE YEARS REPRESENT THE BATTLEGROUND YEARS WHERE PURSUIT AVIATION COMPETED DIRECTLY WITH BOMBARDMENT AVIATION FOR A MISSION WITHIN THE WAR DEPARTMENT. THE FORMATION OF THE GENERAL HEADQUARTERS AIR FORCE IN 1935 MARKS THE START OF THE THIRD PERIOD. IT CONTINUES UNTIL THE FALL OF 1939 WHEN THE UNITED STATES BEGAN TO MOBILIZE FOR WORLD WAR II. THIS PERIOD IS NOTABLE FOR THE REFINEMENT OF DOCTRINE WITHIN THE AIR CORPS. PURSUIT AVIATION IN THIS PERIOD REFINED ITS MISSION AS PRIMARILY A DEFENSIVE FORCE AND PRACTICED TO ACCOMPLISH THAT MISSION. AN UNEASY DÉTENTE HELD BETWEEN BOMBARDMENT AND PURSUIT AVIATION AS EACH DEVELOPED WITHIN ITS OWN NICHE. THE BUILDUP FOR WAR DELINEATES THE FINAL PERIOD. DURING THE BUILDUP, PURSUIT REGAINED SOME OF ITS LOST STATURE, BUT OVERSHADOWED BY THE DRUMS OF WAR, THE RENEWED INTEREST IN PURSUIT WAS TOO LATE TO CHANGE SIGNIFICANTLY THE DOCTRINE DEVELOPED IN THE MID-1930S.

AFTER EXAMINING THE PREWAR DEVELOPMENT OF PURSUIT THEORY, THIS PAPER WILL THEN EXAMINE THE EARLY PERFORMANCE OF PURSUIT AVIATION IN WORLD WAR II. IF THE DECLINE IN PURSUIT AVIATION WAS CRITICAL TO MISSION ACCOMPLISHMENT, THEN THE EARLY PERFORMANCE OF THE UNITED STATES IN WORLD WAR II SHOULD SUFFER AS WELL. SUB-PAR AMERICAN PERFORMANCE SHOULD SERVE AS AN INDICATOR UNDERSCORING WHICH AREAS OF PURSUIT AVIATION NEEDED MORE ATTENTION BETWEEN THE WARS.

THE FINAL SECTION WILL ILLUMINATE THE CRITICAL FACTORS THAT AFFECTED PURSUIT AVIATION. THESE CRITICAL FACTORS, RANGING FROM CONGRESSIONAL BUDGET OVERSIGHT TO INTERNAL DISPUTES, ARE THE SAME FACTORS A STRATEGIST MUST CONTEND WITH TODAY. BY IDENTIFYING THOSE FACTORS DAMAGING TO UNITED STATES PREPAREDNESS FOR WORLD WAR II, ONE CAN SEEK TO PREVENT MAKING THE SAME MISTAKES AGAIN. THEREBY, THROUGH A CLEAR UNDERSTANDING OF WHY PURSUIT AVIATION DOCTRINE DEVELOPED THE WAY IT DID, THE AIR FORCE CAN HELP FORMULATE A PLAN TO KEEP ITS CORE FUNCTION OF PROVIDING AIR SUPERIORITY INTACT WITHOUT NECESSARILY FOCUSING ALL OF ITS ENERGIES ON ITS AIR-TO-AIR MISSION. INSTEAD, BY UNDERSTANDING HOW TO KEEP AIR-TO-AIR CAPABILITY INTACT IN TIMES WHEN LITTLE OR NO AIR THREAT EXISTS, THE AIR FORCE CAN FOCUS ON OTHER MISSIONS AND FURTHER ITS OVERALL CAPABILITIES WITHOUT SACRIFICING ANY OF ITS AIR-TO-AIR COMPETENCE.

⁵ MAJ GEN BENTLEY B. RAYBURN, FORWARD TO LT COL DEVIN L. CATE, "THE AIR SUPERIORITY FIGHTER AND DEFENSE TRANSFORMATION," (MAXWELL AFB, ALA.: AIR UNIVERSITY PRESS, 2003), III, AVAILABLE ON-LINE AT [HTTP://WWW.AU.AF.MIL/AU/AWC/AWCGATE/MAXWELL/MP30.PDF](http://www.au.af.mil/au/awc/awcgate/maxwell/mp30.pdf).

Chapter 1

The Rise and Fall of Pursuit: 1919 to 1926

TO KEEP THE SUPREMACY OF THE AIR, THE ESSENCE OF SUCCESS, THE PURSUIT TYPE OF SQUADRON IS THE BASIC AND ESSENTIAL AGENCY, WITHOUT IT AN AIR SERVICE WOULD BE HELPLESS AND SUBSTANTIALLY USELESS, AS ITS OTHER ELEMENTS COULD NOT OTHERWISE PROPERLY CARRY OUT THEIR DUTIES.

*- LT COL H. A. TOULMIN, JR.
AIR SERVICE, AMERICAN
EXPEDITIONARY FORCE 1918*

PURSUIT AVIATION DID NOT EXIST BEFORE WORLD WAR I. NEVERTHELESS, JUST FOUR YEARS LATER IT HAD BECOME SO IMPORTANT THAT AIRMEN LIKENED IT TO THE INFANTRY AS THE BASIC ARM OF AIR POWER. BOMBARDMENT, ATTACK, AND OBSERVATION COMPRISED LESSER ROLES FOR AIRCRAFT. THE PRIMACY OF PURSUIT AVIATION WAS HIGHLIGHTED IN DOCTRINE AND EVIDENCED BY THE FORCE STRUCTURE AND TRAINING IN THE AIR SERVICE. THE SUPREMACY OF PURSUIT, HOWEVER, WOULD BE SHORT-LIVED. BY 1926, PURSUIT AVIATION'S REIGN AS KING OF AIRPOWER WAS ON THE DECLINE. NO LONGER WAS PURSUIT AVIATION PRIMARY, INSTEAD, IT BECAME MERELY A NECESSARY MISSION ENABLER. BY 1926, BOMBER ADVOCATES BEGAN TO ARGUE THAT BOMBARDMENT WAS THE FUNDAMENTAL MISSION OF AIR POWER, SETTING UP A DEBATE THAT WOULD LAST MUCH OF THE NEXT DECADE. THROUGH 1926, HOWEVER, PURSUIT REMAINED KING, RESTING ON ITS LAURELS FROM WORLD WAR I. BECAUSE AVIATORS BASED EARLY PURSUIT DOCTRINE ON THEIR EXPERIENCE IN WORLD WAR I, UNDERSTANDING PURSUIT EMPLOYMENT IN WORLD WAR I IS CRUCIAL TO GRASPING WHY PURSUIT DOCTRINE DEVELOPED IN THE MANNER IT DID.

Air Service Experience and Lessons from the Great War

THE GREAT POWERS ENTERED WORLD WAR I WITHOUT ANY FORM OF PURSUIT AVIATION. INITIALLY, AIRCRAFT SERVED ONLY AS OBSERVATION PLATFORMS TO ADJUST ARTILLERY FIRE AND REPORT ON ENEMY FORMATIONS. EARLY IN THE WAR, HOWEVER, MILITARY COMMANDERS AND PILOTS ALIKE REALIZED THE VALUE OF OWNING THE SKIES. PILOTS EXPERIMENTED BY CARRYING HANDGUNS AND MOUNTING SLEWABLE MACHINE GUNS TO ATTACK ENEMY PLANES. THUS BEGAN THE FIGHT FOR AIR SUPERIORITY. IN MAY OF 1915, THE GERMANS INTRODUCED THE FIRST AIRCRAFT SPECIFICALLY DESIGNED FOR AIR-TO-AIR COMBAT, THE FOKKER EINDECKER. THE EINDECKER SPORTED A FIXED, SYNCHRONIZED MACHINE GUN FIRING THROUGH THE PROPELLER. A TECHNICAL MARVEL, THE EINDECKER MARKED THE TRUE BIRTH OF PURSUIT AVIATION. ITS SOLE PURPOSE WAS TO PURSUE AND SHOOT DOWN ENEMY AIRCRAFT.¹

THE INTRODUCTION OF THE EINDECKER BEGAN A SHIFT IN AIRCRAFT DESIGN FROM GENERAL PURPOSE TOWARDS SPECIALIZATION. INITIALLY AIRCRAFT FOR OBSERVATION, PURSUIT, AND BOMBARDMENT WERE MODIFICATIONS OF THE SAME BASIC AIRFRAME, BUT BY THE END OF THE WAR, BOTH SIDES HAD DEVELOPED VERY SPECIALIZED AIRCRAFT FOR PURSUIT. FOR THE ALLIES, TWO TYPES OF PURSUIT AIRCRAFT ROAMED THE SKIES IN 1918: SINGLE-SEAT AND TWO-SEAT PURSUIT AIRCRAFT. THE TWO-SEAT AIRCRAFT, FITTED WITH REARWARD-FACING GUNNERS SERVED THE PRIMARY ROLE AS AN ESCORT FIGHTER FOR BOMBER AND OBSERVATION AIRCRAFT. THE REAR GUNNER GAVE THE TWO-SEAT AIRCRAFT A DEFENSIVE CAPABILITY COMPATIBLE WITH ESCORT MISSIONS. SINGLE-SEAT PURSUIT AIRCRAFT, ON THE OTHER HAND, PERFORMED MORE INDEPENDENT OPERATIONS BOTH DEFENSIVELY AND OFFENSIVELY.²

¹ Lee Kennett, *The First Air War 1914-1918* (New York, N.Y.: The Free Press, 1991), 63-69.

² Ibid., 73, 79, 211.

WITHIN THE SINGLE-SEAT FIGHTERS, THERE ALSO DEVELOPED TWO SCHOOLS OF EMPLOYMENT BASED UPON THE CAPABILITIES OF THE FIGHTERS. A USEFUL COMPARISON ARISES BETWEEN THE SPAD XIII AND THE SOPWITH CAMEL. THE ALLIES EMPLOYED BOTH IN 1918, BUT EACH HAD DISTINCTIVE CHARACTERISTICS. THE SPAD HAD SUPERIOR POWER AND DIVING CAPABILITY BUT DID NOT TURN AS WELL AS THE CAMEL. PILOTS FAVORED THE SPAD FOR OFFENSIVE MISSIONS WHERE THEY COULD TAKE ADVANTAGE OF ITS SUPERIOR DIVING AND CLIMB PERFORMANCE AND SURPRISE THEIR ENEMIES WITH ATTACKS FROM ABOVE. THE CAMEL, ON THE OTHER HAND, WAS VERY MANEUVERABLE AND GOOD IN A TURNING FIGHT. THIS GAVE THE CAMEL A SUPERIOR CAPABILITY TO EVADE OR DEFEAT AN ATTACK IF SURPRISED. AVIATORS FOUND THE CAMEL USEFUL FOR DEFENSIVE MISSIONS WHERE ENEMY SURPRISE ATTACKS WERE LIKELY. ONE SUCH MISSION WAS CLOSE ESCORT OF OBSERVATION, ATTACK, AND BOMBARDMENT AIRCRAFT. POST-WAR, PURSUIT AVIATORS FAVORED THE OFFENSIVE CAPABILITIES OF THE SPAD, BUT RECOGNIZED THE IMPORTANCE OF BOTH TYPES OF PLANES. ADDITIONALLY, THEY RECOGNIZED THE NEED FOR ESCORT FIGHTERS TO BE EITHER MANEUVERABLE SINGLE-SEAT FIGHTERS OR DEFENSIVELY EQUIPPED TWO-SEATERS.³

DURING WORLD WAR I, SMALL IMPROVEMENTS IN PERFORMANCE OF A PURSUIT AIRCRAFT COULD HAVE A DRAMATIC EFFECT. NEWER AIRFRAMES SIMPLY OUTPERFORMED OLD AIRCRAFT GIVING THEIR PILOTS A DISTINCT ADVANTAGE. THE GERMANS, FOR INSTANCE, GAINED A MOMENTARY ADVANTAGE WITH THE INTRODUCTION OF THE FOKKER EINDECKER UNTIL THE ALLIES COULD COUNTER WITH A COMPARABLE FIGHTER. IN ADDITION TO THE AIRCRAFT, PILOT SKILL MATTERED AS WELL. ONLY 200 PILOTS ACCOUNTED FOR OVER HALF THE TOTAL KILLS OF WORLD WAR I. THE LESSON AVIATORS DREW FROM WORLD WAR I WAS THAT PURSUIT AVIATION INEXTRICABLY LINKED TOGETHER MAN AND MACHINE AS THE DECISIVE COMBAT ELEMENT. THIS CONCEPT WAS UNTHINKABLE BY THE CONTEMPORARY ARMY OFFICER WHO BELIEVED THE MAN, AND NOT HIS EQUIPMENT, WAS THE DECISIVE ELEMENT IN COMBAT.⁴

Lessons Learned from World War I

SEVERAL LESSONS EMERGED FROM THE GREAT WAR THAT WOULD SHAPE AIRPOWER DOCTRINE IN THE YEARS IMMEDIATELY AFTER THE WAR. THE FIRST LESSON WAS THAT GAINING CONTROL OF THE AIR WAS NECESSARY FOR AIRCRAFT AND GROUND FORCES TO OPERATE EFFECTIVELY. IN WORLD WAR I, PURSUIT WAS THE MEANS TO GET CONTROL OF THE AIR; THEREFORE, AVIATORS VIEWED PURSUIT AVIATION AS THE DOMINANT FORM OF AVIATION. GEN CARL SPAATZ, A WORLD WAR I PURSUIT PILOT, NOTED "I THINK ONE OF THE THINGS THAT SOME OF US FELT WAS THE FIGHTER PLANE DOMINATED THE SITUATION, AND IN ORDER TO OPERATE EFFECTIVELY, YOU HAD TO HAVE FIGHTERS TO GET CONTROL OF THE AIR OVER THE AREA YOU WERE OPERATING IN."⁵ THIS VIEW WAS NOT CONFINED TO PURSUIT PILOTS, BUT PERMEATED THE AIR FORCES. GEN GEORGE KENNEY, AN OBSERVATION PILOT DURING WORLD WAR I, NOTED HIS DESIRE TO HAVE HAD FIGHTER COVERAGE. "WE'D LIKE TO HAVE SEEN A FEW FIGHTERS OVER US ONCE IN A WHILE WHEN WE WERE DOING SOME OF THESE LONGER RANGE MISSIONS... WE NEVER COULD GET ANY FIGHTERS OVER THERE BECAUSE THE FIGHTERS SEEMED TO OPERATE BETWEEN THE TWO BALLOON LINES, AND THAT DIDN'T GIVE US MUCH HELP. SO WE WERE ALL YELLING FOR A FIGHTER TO ACCOMPANY BOMBERS OR LONG RANGE RECONNAISSANCE MISSIONS."⁶

IN ADDITION TO BEING THE MOST IMPORTANT MISSION, PURSUIT AVIATION WAS ALSO A HIGHLY VISIBLE FORM OF AIRPOWER. GROUND TROOPS ON THE FRONTLINE WITNESSED FIRSTHAND THE

³ Air Corps Tactical School, "Pursuit Aviation: A Brief Study" (Maxwell Air Field, Ala.: thesis, Air Corps Tactical School, 1931-1932), 25-26. Air Force Historical Research Agency (AFHRA) 248-282-8, and Maj Thomas DeW. Milling, Air Service Field Officers' School Training Regulation No. 440-15, *Air Tactics*, 1922, 13-15, AFHRA 248.101-4A.

⁴ Harlan T. McCormick, "History and Development of Pursuit Aviation" (Maxwell Air Field, Ala.: thesis, Air Corps Tactical School, 1937-1938), 2, AFHRA 248.282-36 and Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm 1917-1941* (1955; reprint, Washington, D.C.: Office of Air Force History, 1985), 6.

⁵ Gen Carl A. Spaatz, transcript of oral history interview by Author Goldberg, 19 May 1965, 7. AFHRA K239.0512-755.

⁶ Gen George C. Kenney, transcript of oral history interview by Col Marvin Stanley, n.d., 10, AFHRA K239.0512-747.

ESCAPADES OF PURSUIT AVIATION. WAGING GREAT AIR BATTLES OVER TRENCHES, THE “KNIGHTS OF THE AIR,” AS THEY CAME TO BE KNOWN, DREW THE ATTENTION OF THE SOLDIER AND PUBLIC AT HOME AS WELL. THE AIR BATTLES EARNED PURSUIT PILOTS A STATUS ABOVE THE COMMON SOLDIER AND PILOT. “WORLD WAR I SAW THE GLORIFICATION OF THE FIGHTER ACE. SUCH AMERICAN FLYING HEROES... BECAME BETTER KNOWN TO THE AMERICAN PUBLIC THAN ALL EXCEPT A HANDFUL OF AMERICAN GENERALS.”⁷

THE GLORIFICATION OF PURSUIT ADVANCED THE DEVELOPMENT OF FIGHTER AVIATION BY HELPING THE AIR SERVICE SECURE A MISSION OUTSIDE THE OBJECTIVES OF THE GROUND FORCES. BECAUSE GROUND COMMANDERS COULD SEE THE IMMEDIATE EFFECTS OF PURSUIT AVIATION, AVIATORS WERE BETTER ABLE TO ARGUE THEIR CASE FOR THE NECESSITY OF AIR SUPERIORITY. THE ARMY, HAVING WITNESSED FIRST HANDS THE EFFECTS OF AIR CONTROL, READILY ACCEPTED THE CONCEPT OF AIR SUPREMACY AS A VITAL AND NECESSARY ROLE FOR THE AIR SERVICE. THE 1925 TO 1926 ARMY WAR COLLEGE (AWC) TEXT, *FUNDAMENTAL PRINCIPLES FOR THE EMPLOYMENT OF THE AIR SERVICE*, HIGHLIGHTS THE ACCEPTANCE OF PURSUIT AVIATION. “THE EFFECTIVENESS OF ALL OTHER BRANCHES OF THE AIR SERVICE AS WELL AS THAT OF MANY GROUND ACTIVITIES IS DIRECTLY LIMITED BY THE EXTENT TO WHICH PURSUIT AVIATION DOMINATES THE AIR.”⁸ THE ARMY’S ACKNOWLEDGEMENT OF A MISSION, ACHIEVABLE ONLY THROUGH AIRPOWER, SUPPORTED THE AIRMEN’S CALLS FOR THE SEPARATION OF THE AIR FORCE AS AN INDEPENDENT FIGHTING ELEMENT.

THE SECOND LESSON AIRMEN DERIVED FROM WORLD WAR I EXPERIENCES WAS THE INTRINSICALLY OFFENSIVE NATURE OF AIRPOWER. PURSUIT PILOTS, IN PARTICULAR, FOUND SURPRISE, HIGHER ALTITUDE, AND GREATER NUMBERS TO BE ESSENTIAL TO ATTAINING AN ADVANTAGE. ONLY BY ACTING OFFENSIVELY, COULD THEY MAXIMIZE THESE ADVANTAGES AND INCREASE THEIR CHANCES OF DEFEATING ENEMY AIRCRAFT. ON THE OTHER SIDE, IF THE ENEMY CAUGHT THE PURSUIT PILOT IN A DEFENSIVE SITUATION HIS CHANCES OF SURVIVAL DIMINISHED GREATLY. UNLIKE THE GROUND BATTLE WAGING BELOW THE PILOTS, WHERE THE DEFENSE WAS THE STRONGER FORM OF FORCE, PILOTS FOUND THE OFFENSE TO BE THE MORE EFFECTIVE MEANS TO VICTORY. MAJ THOMAS MILLING, IN HIS 1922 AIR SERVICE FIELD OFFICERS’ SCHOOL TEXT *AIR TACTICS* ENCAPSULATED THE OFFENSIVE NATURE OF PURSUIT AVIATION. “THE MAIN ROLE – ALMOST THE ONLY ROLE, PROPERLY SPEAKING – OF PURSUIT AVIATION IS TO SEEK OUT AND DESTROY THE HOSTILE AIR FORCE. ITS FUNCTION IS A FIGHTING UNIT PURE AND SIMPLE. THE OFFENSIVE SPIRIT IS THE VERY ESSENCE OF ITS EMPLOYMENT.”⁹

THE EFFECT OF THIS REVELATION WAS THAT AIRMEN BELIEVED PURSUIT NEEDED TO OPERATE OFFENSIVELY REGARDLESS OF THE MISSION IT WAS FLYING.¹⁰ THIS REVELATION ALTERED THE METHOD PURSUIT PILOTS USED TO PROTECT OTHER AIRCRAFT. CLOSE ESCORT PROVIDED PROTECTION TO OBSERVATION, ATTACK, AND BOMBARDMENT AIRCRAFT BY FLYING IN FORMATION WITH THEM. THE DRAWBACK TO CLOSE ESCORT WAS THAT IT FORCED THE ESCORT AIRCRAFT TO FLY AT THE ESCORTEE’S SPEED AND ALTITUDE ENABLING HOSTILE PURSUIT AIRCRAFT TO CATCH THE ESCORT FIGHTER AT A DISADVANTAGE IN SPEED AND ALTITUDE AT THE START OF THE AIR-TO-AIR FIGHT. TO COUNTER THIS PROBLEM, AND PREVENT FIGHTING AT A DISADVANTAGE, PURSUIT PILOTS DEVELOPED DETACHED ESCORT, REJECTING CLOSE ESCORT AS BEING TOO DEFENSIVE. AS DETACHED ESCORT, THE PURSUIT AIRCRAFT WOULD SWEEP AHEAD OF THE ESCORTING AIRCRAFT OR OPERATE NEAR, BUT NOT DIRECTLY WITH, THE AIRCRAFT THEY WERE SUPPORTING. THIS GAVE THE PURSUIT AIRCRAFT THE FREEDOM TO OPERATE OFFENSIVELY WHILE MAINTAINING SUPPORT FOR THE OTHER AIRCRAFT. THIS TECHNIQUE WORKED EXTREMELY WELL FOR PURSUIT AIRCRAFT. ATTACK OR BOMBARDMENT AIRCRAFT DREW THE ENEMY INTO THE AIR AND ATTRACTED THE ENEMY PURSUIT AIRCRAFT, ENABLING FRIENDLY PURSUIT TO ATTACK THEM FROM A POSITION OF ADVANTAGE.¹¹

⁷ Alfred Goldberg, ed., *A History of the United States Air Force, 1907-1957* (Princeton, N.J.: D. Van Nostrand, 1957), 27.

⁸ Army War College, *Fundamental Principles for the Employment of the Air Service 1925-1926*, Carlisle Barracks, Pa., 1925-1926, 3, AFHRA 248.211-65F.

⁹ Milling, *Air Tactics*, 11-12.

¹⁰ Initially, pursuit aircraft were termed scout aircraft, but the British changed the designation to fighter to denote their offensive mission. The United States accepted pursuit from the French who used the term Chasse or “chase” for the same reason.

¹¹ Milling, *Air Tactics*, 1922, 10-11 and William C. Sherman, *Air Warfare* (1926, reprint Maxwell AFB, Ala.: Air University Press, 2002), 123-124.

ONE OF THE KEYS TO OFFENSIVE EMPLOYMENT WAS MEETING THE ENEMY WITH A SUPERIOR FORCE. BOTH SIDES FOUND LARGER FORMATIONS OF AIRCRAFT IMPROVED THE CHANCES OF SURVIVAL. THIS LED TO THE THIRD MAJOR PURSUIT LESSON OF WORLD WAR I. PURSUIT NEEDED TO CONCENTRATE ITS EFFORTS TO BE SUCCESSFUL. EARLY IN THE WAR, PURSUIT PILOTS TRIED AERIAL BARRAGES TO COVER THE ENTIRE FRONT. PURSUIT FORMED AN AERIAL BARRAGE BY SPREADING ITS AIRCRAFT UNIFORMLY ACROSS THE FRONT. WHILE THE BARRAGE ENABLED THE AIRMEN TO DEFEND THE ENTIRE FRONT, IT LEFT THE DEFENDING FORCE SPREAD EQUALLY THIN ACROSS THE FRONT. THE PROBLEM WAS THAT ANYWHERE ALONG THE FRONT THE ENEMY COULD OVERWHELM THE DEFENDING FORCE BY CONCENTRATING ON ONE SECTION OF THE FRONT WITH A SUPERIOR NUMBER OF AIRCRAFT. TO COUNTER THIS PROBLEM, PURSUIT PILOTS GAVE UP PROTECTING ALL THE AIRSPACE INADEQUATELY FOR THE ABILITY TO CONCENTRATE AT THE KEY POINTS AND DEFEND THE VITAL AREAS APPROPRIATELY. THEY ARGUED THAT THE SUPERIOR MOBILITY OF THE AIRPLANE ALLOWED IT TO COVER A MUCH GREATER AREA AND MASS FORCES WHEN AND WHERE THEY WERE NEEDED. AS A RESULT, BY THE END OF THE WAR, MASSIVE AIR BATTLES WITH ENORMOUS FORMATIONS OF PURSUIT AIRCRAFT TYPIFIED AIR-TO-AIR COMBAT.¹²

THE DILEMMA OF CONCENTRATING IN ONE AREA WAS THAT IT GAVE UP AIR SUPERIORITY OVER ALL BUT A SMALL SECTION OF THE BATTLE SPACE. THIS DOWNSIDE OF PURSUIT AVIATION NEEDING TO CONCENTRATE TO GAIN THE OFFENSIVE GAVE RISE TO THE BELIEF THAT PURSUIT AVIATION COULD NOT MAINTAIN AIR CONTROL OVER THE WHOLE BATTLEFIELD. CAPT WILLIAM SHERMAN HIGHLIGHTED THE PROBLEM OF CONTROL OF AIR NOTING ITS DIFFERENCE FROM SEA CONTROL IN THAT "CONTROL OF THE AIR IS NOT AN ABSOLUTE BUT A RELATIVE CONDITION. IT IS GENERALLY RESTRICTED IN SCOPE AND FLEETING IN DURATION."¹³ THE BOMBER VERSUS FIGHTER DEBATE IN THE ENSUING YEARS LEADING UP TO WORLD WAR II ACCENTUATED THIS PROBLEM. DURING THIS PRE-RADAR PERIOD, BOMBER PROPONENTS ARGUED SUCCESSFULLY THAT BECAUSE PURSUIT COULD NOT DEFEND THE ENTIRE AIRSPACE, BOMBARDMENT AIRCRAFT COULD SIMPLY AVOID HOSTILE PURSUIT ENROUTE TO THEIR TARGETS. THIS ARGUMENT BECAME ONE OF THE KEY ARGUMENTS FOR STRATEGIC BOMBING VERSUS PURSUIT AIRCRAFT. HOWEVER, DURING THE EARLY 1920S THIS ARGUMENT HAD NOT CONGEALED AND PURSUIT AVIATION WAS STILL THE CENTRAL FOCUS FOR AIRMAN AND PURSUIT EMPLOYMENT DOMINATED THE DOCTRINE THEY PUBLISHED.

Translating Lessons into Doctrine

OUTSIDE OF MITCHELL, TWO KEY FIGURES STAND OUT DURING THIS ERA IN TERMS OF CODIFYING US AIR SERVICE DOCTRINE: MAJ THOMAS MILLING AND CAPT WILLIAM SHERMAN. MILLING, AS THE OFFICER IN CHARGE OF THE AIR SERVICE FIELD OFFICERS' SCHOOL, LATER RENAMED THE AIR SERVICE TACTICAL SCHOOL (ASTS), INFLUENCED THE DEVELOPMENT OF AIR SERVICE DOCTRINE, WHILE SHERMAN CODIFIED IT. SHERMAN, A FACULTY MEMBER AT THE SCHOOL FROM 1920 TO 1923, WROTE MANY OF THE ASTS'S TEXTBOOKS INCLUDING *FUNDAMENTAL PRINCIPLES FOR THE EMPLOYMENT OF THE AIR SERVICE*, A COMPREHENSIVE LOOK AT AIRPOWER EMPLOYMENT. IN ADDITION TO THEIR CLASSROOM USE, SHERMAN'S TEXTS FORMED THE BASIS FOR AIR SERVICE DOCTRINE IN THE EARLY 1920S.¹⁴

THE DOCTRINE MILLING AND SHERMAN DEVELOPED CAPTURED THE LESSONS OF WORLD WAR I, CROWNING PURSUIT AVIATION AS THE BASIC ARM OF THE AIR SERVICE. MILLING'S COMMENT BEFORE THE ARMY WAR COLLEGE IN 1923 SUMS UP THE AVIATOR'S VIEW OF PURSUIT AVIATION: "PURSUIT IN ITS RELATION TO THE AIR SERVICE AND AIR FORCE MAY BE COMPARED TO THE INFANTRY IN ITS RELATION TO THE OTHER BRANCHES OF THE ARMY. WITHOUT PURSUIT, THE SUCCESSFUL EMPLOYMENT OF OTHER AIR BRANCHES IS IMPOSSIBLE."¹⁵ HIS 1922 AIR SERVICE FIELD OFFICERS' SCHOOL TEXT *AIR TACTICS* ELABORATED ON THE ANALOGY:

IN ITS SPHERE THEN, PURSUIT MAY BE LIKENED TO INFANTRY. IT IS THE BRANCH OF AVIATION WHOSE FAILURE OR SUCCESS WILL VERY LARGELY DETERMINE THE FAILURE

¹² Sherman, *Air Warfare*, 124-126.

¹³ Ibid., 120.

¹⁴ Col Wray R. Johnson, in introduction to William C. Sherman, *Air Warfare* (1926, reprint Maxwell AFB, Ala.: Air University Press, 2002), xiv.

¹⁵ Maj Thomas DeW. Milling, "Tactics of the Air Forces in War," lecture, Army War College, Washington Barracks, D.C., 27 November 1923, 10, AFHRA 248.211-65N.

OR SUCCESS OF ALL AIRCRAFT. THE COMPARISON CANNOT, HOWEVER, BE CARRIED TOO FAR. INFANTRY SUCCESS OR FAILURE MEANS IN GENERAL THE FINAL DETERMINATION OF THE ISSUE—IT IS THE END. WHILE SUCCESS OF PURSUIT IS A MEANS... NONE THE LESS, THE BACKBONE OF THE AIR FORCES ON WHICH THE WHOLE PLANE OF EMPLOYMENT MUST BE HUNG, IS PURSUIT.¹⁶

FROM THAT REALIZATION, MILLING ARGUED, “THE DOCTRINE OF THE AIR FORCE – AND OF PURSUIT SPECIFICALLY – CAN BE THEREFORE, ONE THING: THE FIRST DUTY IS TO GAIN AND HOLD CONTROL OF THE AIR.”¹⁷

A 1923 PUBLICATION ENTITLED *FUNDAMENTAL CONCEPTIONS OF THE AIR SERVICE* PREPARED UNDER THE DIRECTION OF THE MAJ GEN MASON PATRICK, CHIEF OF THE AIR SERVICE, SUPPORTED MILLINGS CONCLUSION THAT CONTROL OF THE AIR WAS A SERVICE-WIDE MISSION. IT ALSO STATED “THE PRIMARY MISSION OF MILITARY AVIATION IS TO SEEK OUT, ATTACK AND DESTROY THE AVIATION OF THE ENEMY; TO ATTACK HIS FORMATIONS, BOTH TACTICAL AND STRATEGICAL, ON THE GROUND AND ON THE WATER AND TO RENDER SUCH ASSISTANCE TO OTHER UNITS OF THE ARMY AS MAY BE PRESCRIBED BY COMPETENT AUTHORITY.” THE DOCUMENT NOTES PURSUIT’S CONTRIBUTION: “THE FUNCTION OF PURSUIT AVIATION IS TO ESTABLISH AND MAINTAIN SUPREMACY OF THE AIR.”¹⁸ TO GAIN SUPREMACY OF THE AIR, THE PUBLICATION DESCRIBED THREE APPLICATIONS OF PURSUIT AVIATION: OFFENSIVE MISSIONS TO SEEK OUT AND DESTROY ENEMY FIGHTERS, DEFENSIVE MISSIONS FROM GROUND AND AIR ALERT TO PROTECT CRITICAL GROUND TARGETS, AND PROTECTION MISSIONS TO ESCORT OTHER AIRCRAFT. THE DOCUMENT ALSO NOTED AN ADDITIONAL ROLE OF GROUND ATTACK FOR PURSUIT AS WELL. THESE MISSIONS MIRRORED THOSE THAT PURSUIT FIGHTERS HAD FLOWN IN WORLD WAR I, AND SERVED AS THE BASIS FOR PURSUIT FIGHTER TRAINING AND EMPLOYMENT.

ONCE THE AIR SERVICE ACCEPTED CONTROL OF THE AIR AS THE PRIMARY MISSION OF PURSUIT AIRCRAFT, THEN BY DEFAULT THE PRIMARY TARGET OF PURSUIT AVIATION BECAME ENEMY PURSUIT AVIATION BECAUSE ONLY ENEMY PURSUIT CHALLENGED CONTROL OF THE AIR. AS THE AWC AVIATION COURSE IN 1925-26 PUT IT, “THE OBJECTIVE OF PURSUIT ATTACK IS THAT PART OF THE HOSTILE AIR SERVICE WHICH CONSTITUTES THE GREATEST MENACE TO THE FRIENDLY FORCES AS A WHOLE. THIS IS GENERALLY, BUT NOT ALWAYS, THE HOSTILE PURSUIT AVIATION.”¹⁹ BY DEFEATING THE HOSTILE PURSUIT, AIRMEN MAINTAINED THAT THEY WOULD GAIN CONTROL OF THE AIR BECAUSE THE REST OF THE HOSTILE AIR FORCES WOULD BE UNPROTECTED, ALLOWING THE AIR SERVICE TO DESTROY THEM AT WILL.²⁰

THE ARMY, HOWEVER, DID NOT FULLY ACCEPT THIS THEORY. THE ARMY ESPOUSED THE MORE CONSERVATIVE POSITION THAT “SUPREMACY OF THE AIR CANNOT BE MAINTAINED OVER THE ENTIRE FRONT OF ANY THEATRE... THE MOST [ONE] CAN HOPE FOR IS TO MAINTAIN COMPLETE SUPREMACY OVER THAT PORTION OF THE FRONT WHERE A MAJOR EFFORT IS BEING MADE.”²¹ THIS STATEMENT REFLECTED THE OVERALL VIEW OF ARMY LEADERS THAT THE PRIMARY MISSION OF THE AIR SERVICE WAS NOT TO GAIN AIR SUPREMACY, BUT TO SUPPORT THE ARMY.

THE VIEW OF THE ARMY IS APPARENT IN THE ARMY’S FIRST OFFICIAL DOCTRINE ON AVIATION. THAT DOCTRINE, TRAINING REGULATION (TR) 440-15 *FUNDAMENTAL PRINCIPLES FOR THE EMPLOYMENT OF THE AIR SERVICE*, PUBLISHED ON 26 JANUARY 1926, WAS A REVISED VERSION OF SHERMAN’S 1923 TEXT BY THE SAME NAME. NOTABLY, THE ARMY’S OFFICIAL VERSION SUBTLY CHANGED AIR SERVICE’S MISSION TO READ, “THE MISSION OF THE AIR SERVICE IS TO ASSIST THE GROUND FORCES TO GAIN STRATEGICAL AND TACTICAL SUCCESSES BY DESTROYING ENEMY AVIATION, ATTACKING ENEMY GROUND FORCES AND OTHER ENEMY OBJECTIVES ON LAND OR SEA, AND IN CONJUNCTION WITH OTHER AGENCIES TO PROTECT GROUND FORCES FROM HOSTILE AERIAL

¹⁶ Milling, *Air Tactics*, 13.

¹⁷ *Ibid.*, 13.

¹⁸ The Air Service, *Fundamental Conceptions of the Air Service*, 1923, 2, 5, AFHRA 248.211-65S.

¹⁹ Army War College, *Fundamental Principles*, 3.

²⁰ William Mitchell quoted in Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm 1917-1941* (1955; reprint, Washington, D.C.: Office of Air Force History, 1985), 37.

²¹ Army War College, *Fundamental Principles*, 10.

OBSERVATION AND ATTACK.”²² THE LARGEST CONTRAST BETWEEN THE AIR SERVICE’S 1923 *FUNDAMENTAL CONCEPTIONS* AND THE 1926 OFFICIAL TR 440-15 WAS THAT THE OFFICIAL DOCTRINE CLEARLY DEFINED THE AIR SERVICE AS SUBSIDIARY PART OF THE ARMY AND DIRECTED ITS EFFORTS TO SUPPORT THE GROUND EFFORT.

ON THE OTHER HAND, THE 1926 TR 440-15 AGREED WITH THE AIR SERVICE’S VIEWS IN MANY OTHER AREAS. IT ACKNOWLEDGED THE OFFENSIVE NATURE OF PURSUIT AVIATION CHARGING, “ITS PRINCIPLE MISSION IS OFFENSIVE, DEFENSIVE MISSIONS BEING CARRIED OUT ONLY UNDER SPECIAL CIRCUMSTANCES.” THE REGULATION FURTHER RECOGNIZED THE NEED TO AMASS PURSUIT FORCES IN SUPERIOR NUMBERS TO THOSE OF THE ENEMY. OF PARTICULAR NOTE, HOWEVER, TR 440-15 ONLY RECOGNIZED TWO MISSIONS FOR PURSUIT AIRCRAFT: OFFENSIVE AND DEFENSIVE. OFFENSIVE MISSIONS INCLUDED INDEPENDENT PURSUIT OPERATIONS AND ESCORT MISSIONS IN COOPERATION WITH ATTACK OR BOMBARDMENT AIRCRAFT. “DEFENSIVE MISSIONS [HAD] FOR THEIR OBJECT THE PROTECTION OBSERVATION AIRCRAFT, CONVOYS, LINES OF MARCH, AND GROUND FORCES.” THE DELINEATION OF THE TWO MISSIONS FOR PURSUIT AIRCRAFT IS ATTRIBUTABLE TO A BROADER MOVE WITHIN THE AIR SERVICE TO DIVIDE ITS FORCES INTO TWO BRANCHES SEPARATED BY MISSION. THE FIRST BRANCH, THE *AIR SERVICE*, SUPPORTED THE ARMY WITH OBSERVATION, DEFENSIVE PATROLS AND CLOSE AIR SUPPORT; WHILE THE SECOND, THE *AIR FORCE*, OPERATED INDEPENDENTLY OF ARMY OBJECTIVES THROUGH DEEP ATTACKS BEHIND ENEMY LINES. THE SPLIT BETWEEN THE *AIR SERVICE* AND *AIR FORCE* FIRST BEGAN IN 1923 WITH FINDINGS BY THE LASSITER BOARD.

The Lassiter Board, Morrow Board, and the Air Corps Act

THE INTERWAR YEARS WITNESSED TREMENDOUS CHANGE IN AVIATION, NOT ALL OF WHICH WAS INTERNAL TO THE AIR SERVICE, CONGRESSIONAL AND ARMY BOARDS CAUSED SOME OF THE CHANGE. THE LASSITER BOARD, A SPECIAL BOARD APPOINTED BY THE WAR DEPARTMENT IN MARCH 1923, STUDIED THE AIR SERVICE. ITS REPORT, IN APRIL 1923, BECAME THE FUNDAMENTAL GUIDANCE FOR AIR ARM POLICY.²³ THE LASSITER BOARD FORMALLY RECOGNIZED TWO DISTINCT FUNCTIONS OF AIRPOWER, THE *AIR SERVICE* AND THE *AIR FORCE*. THE DISTINCTION SEPARATED ARMY AUXILIARY FUNCTIONS FROM OTHER AIRPOWER MISSIONS. BOARD MEMBERS ACCEPTED THE DISTINCTION IN PART BECAUSE PURSUIT AVIATION HAD SHOWN THE NEED FOR MISSIONS BEYOND THE INFLUENCE OF THE ARMY BY DEMONSTRATING THE IMPORTANCE OF AIR SUPERIORITY. WHILE NOT GRANTING INDEPENDENCE TO THE AIR SERVICE, THE BOARD ACKNOWLEDGED INDEPENDENT MISSIONS FOR THE AIR SERVICE AND SETUP THE *AIR FORCE* AS A MEANS TO EXECUTE THOSE INDEPENDENT MISSIONS. IN ADDITION TO CREATING AN *AIR FORCE* WITHIN THE AIR SERVICE, THE LASSITER BOARD HIGHLIGHTED THE SHORTCOMINGS OF AIRCRAFT IN THE AIR SERVICE AND LAID THE GROUNDWORK FOR THE FUTURE FORCE STRUCTURE OF THE AIR SERVICE.²⁴

IN RESPONSE TO THE LASSITER REPORT, THE HOUSE OF REPRESENTATIVES ESTABLISHED THE LAMPERT COMMITTEE IN MARCH OF 1924 TO EXAMINE THE REPORT’S FINDINGS. THE LAMPERT COMMITTEE CAME TO THE THEN REVOLUTIONARY CONCLUSION THAT “WE CAN HAVE NO ADEQUATE NATIONAL DEFENSE WITHOUT AN ADEQUATE AIR FORCE.”²⁵ IT THEREFORE RECOMMENDED A MORE INDEPENDENT AIR FORCE AND AGREED IN CONCEPT WITH THE FINDINGS OF THE LASSITER BOARD.

FEARING THE FINDINGS OF THE LAMPERT COMMITTEE WOULD LEAD TO AN INDEPENDENT AIR ARM, THE SECRETARIES OF WAR AND THE NAVY ASKED THE PRESIDENT TO SET UP ANOTHER BOARD TO STUDY AIR POWER AND NATIONAL DEFENSE BEFORE THE LAMPERT COMMITTEE COULD PUBLISH ITS FINDINGS. THE PRESIDENT COMPLIED, CONVENING THE MORROW BOARD. THE MORROW BOARD SERVED AS A COUNTEROFFENSIVE FOR THE WAR DEPARTMENT TO COUNTERACT THE LAMPERT

²² War Department Training Regulation (WDTR) 440-15, *Fundamental Principles for the Employment of the Air Service*, 26 January 1926, 1. AFHRA 170.108.

²³ Irving Brinton Holley, Jr., *Buying Aircraft: Material Procurement for the Army Air Forces* (Washington, D.C.: Center of Military History, 1989), 44-45.

²⁴ Maj Gen William Lassiter et al, *Report of a Committee of Officers Appointed by the Secretary of War* (Washington, D.C.: War Department, 22 March 1923), 4-5, AFHRA 145.93-102A.

²⁵ “Lampert Committee Report,” quoted in David E. Johnson, *Fast Tanks and Heavy Bombers* (Ithaca, N.Y.: Cornell University Press, 1998), 88.

COMMITTEE'S FINDINGS.²⁶ THE BOARD CAME TO MANY CONCLUSIONS IN DIRECT CONFLICT WITH THE LAMPERT COMMITTEE, AND DOWNPLAYED THE IMPORTANCE OF THE AIR FORCE IN NATIONAL DEFENSE. IT NOTED, "PROTECTED, AS THE UNITED STATES IS, BY BROAD OCEANS FROM POSSIBLE ENEMIES...THERE IS NO PRESENT REASON FOR APPREHENSION OF ANY INVASION FROM OVERSEAS DIRECTLY BY WAY OF THE AIR; NOR INDEED IS THERE ANY APPARENT PROBABILITY OF SUCH AN INVASION IN ANY FUTURE WHICH CAN BE FORESEEN." IT ALSO NOTED THAT AIRPOWER WAS INHERENTLY OFFENSIVE AND AT ODDS WITH CURRENT UNITED STATES POLICY, WHICH FAVORED DEFENSE OPERATIONS FOR THE US MILITARY.²⁷ IN REAFFIRMING THE DEFENSIVE NATURE OF UNITED STATES SECURITY POLICY, THE BOARD PUSHED PURSUIT AVIATION'S DEVELOPMENT TOWARDS A HEMISPHERIC DEFENSE MISSION.

ALTHOUGH THE MORROW BOARD DEFLATED THE AIR SERVICE'S JUSTIFICATION FOR INDEPENDENCE, THE BOARD DID HAVE SEVERAL FINDINGS IN FAVOR OF THE AIR SERVICE. FIRST, THE BOARD RECOMMENDED THE CREATION OF THE AIR CORPS, UNIFYING AVIATION IN THE ARMY AND RECOGNIZING THE ROLE "OF AN AIR FORCE ACTING ALONE ON A SEPARATE MISSION." SECOND, THE BOARD CALLED FOR A FIVE-YEAR PLAN TO REEQUIP THE AIR CORPS WITH NEW PLANES. FINALLY, THE BOARD HIGHLIGHTED THE CLOSE DEPENDENCY BETWEEN CIVILIAN AVIATION AND ITS MILITARY COUNTERPART. SPECIFICALLY, THE BOARD RECOMMENDED INVESTMENT IN THE AIRMAIL SERVICE AND CIVILIAN AIRWAY INFRASTRUCTURE TO PROMOTE CIVILIAN AVIATION AND THEREBY ADVANCE MILITARY AVIATION.²⁸

THE COMBINED LAMPERT AND MORROW REPORTS PROMPTED CONGRESS TO PASS THE AIR COMMERCE ACT AND AIR CORPS ACT OF 1926. THE AIR CORPS ACT ESTABLISHED THE AIR ELEMENT AS A SEPARATE CORPS UNDER AN ASSISTANT SECRETARY OF WAR FOR AIR AND SET IN MOTION A FIVE-YEAR PLAN TO REBUILD THE AIR CORPS. ALTHOUGH THE PLAN REDUCED THE LASSITER BOARD'S RECOMMENDATION OF 2,500 PLANES TO 1,800 WITH 400 ON ORDER, IT PROVIDED AN EXPANSION PLAN FOR THE AIR CORPS AND A MEANS TO MODERNIZE ITS FORCE. THE COMBINATION OF THE TWO ACTS INVIGORATED INTERACTION BETWEEN CIVILIAN AND MILITARY AVIATION SETTING THE STAGE FOR THE NEXT DECADE OF AIR CORPS GROWTH.²⁹

Training and Exercises

THE POSTWAR DRAWDOWN AND DEPLETION OF THE AIR SERVICE IN THE EARLY 1920S THAT LED TO THE AIR CORPS ACT HAD A TELLING EFFECT ON PURSUIT TRAINING. IN 1922, THE AIR SERVICE GROUPED ALL PURSUIT AVIATION TOGETHER UNDER THE 1ST PURSUIT GROUP AT SELFRIDGE, MICHIGAN. AS WITH THE REST OF THE AIR SERVICE, AIRCRAFT AND EQUIPMENT SHORTAGES AT THE 1ST PURSUIT GROUP PREVENTED LARGE-SCALE TRAINING. CAPT HARLAN MCCORMICK IN HIS 1937 AIR CORPS TACTICAL SCHOOL (ACTS) THESIS NOTES, "DUE TO THE WOEFUL LACK OF EQUIPMENT AND SMALL SIZE OF THE COMMAND, THE 1ST PURSUIT GROUP, FOR A NUMBER OF YEARS, WAS ABLE TO CARRY OUT VERY LITTLE TRAINING AS A UNIT.... IT WAS NOT UNTIL 1930 THAT THE 1ST PURSUIT GROUP HAD 72 AIRPLANES IN THE AIR." HE FURTHER NOTES, HOWEVER, "INDIVIDUALS WERE TRAINED TO A HIGH DEGREE."³⁰ EVEN THOUGH DOCTRINE AND EXPERIENCE FROM WORLD WAR I DICTATED THAT PURSUIT AIRCRAFT SHOULD BE CONCENTRATED IN LARGE GROUPS FOR THE OPTIMUM EFFECT, IN THE AIR SERVICE ERA, THE 1ST PURSUIT GROUP COULD ACCOMPLISH LITTLE LARGE FORMATION TRAINING. INSTEAD, TRAINING FOCUSED PRIMARILY ON IMPROVING THE INDIVIDUAL PILOT.

PURSUIT SPECIFIC TRAINING FOR EACH PILOT STARTED WITH INDIVIDUAL ACROBATICS AND THEN ADVANCED TO THREE-SHIP FORMATION FLYING. COMBAT TRAINING INCLUDED MOCK ONE-ON-ONE COMBAT VERSUS HIS INSTRUCTOR IN SINGLE-SEAT AIRCRAFT AND PRACTICE IN THE BACKSEAT OF TWO-SEATERS AS A FIGHTING OBSERVER. AS THE PILOT PROFICIENCY INCREASED, THE NUMBER OF AIRCRAFT IN THE MOCK COMBAT INCREASED, ALLOWING THE PILOT TO GAIN EXPERIENCE IN COMBAT FORMATIONS. PURSUIT PILOTS ALSO PRACTICED AIR-TO-GROUND GUNNERY, AIR-TO-AIR GUNNERY ON A TOWED

²⁶ Holley, 46.

²⁷ *Report of the President's Aircraft Board* (Washington, D.C.: Government Printing Office, 1925), 6-7, 10.

²⁸ *Ibid.*, 8-10, 19, 21.

²⁹ Johnson, *FT&HB*, 90.

³⁰ McCormick, 11.

TARGET, BOMBING, AND NIGHT FLYING.³¹ GUNNERY COMPETITION BETWEEN INDIVIDUAL PILOTS BEGAN IN 1924 WITH AN ANNUAL AERIAL GUNNERY AND BOMBING COMPETITION AT LANGLEY FIELD. THE COMPETITION INCLUDED AIR SERVICE, NATIONAL GUARD, AND MARINE CORPS PILOTS. PURSUIT PILOTS DEMONSTRATED THEIR INDIVIDUAL CAPABILITIES, COMPETING IN SIX EVENTS INCLUDING AIR-TO-AIR AND AIR-TO-GROUND GUNNERY.³² THE 1ST PURSUIT GROUP CONSIDERED AERIAL GUNNERY A CORE COMPETENCY FOR THE PURSUIT PILOT AND SCHEDULED TRAINING EVERY DAY OF THE WEEK EXCEPT FOR WEDNESDAY. THE AMOUNT OF ACTUAL INDIVIDUAL GUNNERY ACCOMPLISHED IS UNKNOWN; HOWEVER, AS THE RANGE WAS 130 MILES FROM THE BASE AND AMMUNITION WAS IN SHORT SUPPLY.³³ IN ADDITION TO GUNNERY TRAINING, EACH PURSUIT PILOT RECEIVED INSTRUMENT AND NAVIGATION TRAINING. WHILE INDIVIDUAL GUNNERY INCREASED THE PURSUIT PILOT'S TACTICAL ABILITY, CROSS-COUNTRY NAVIGATION WAS CENTRAL TO THE PURSUIT FIGHTERS' STRATEGIC MOBILITY.

THE FIRST WORLD WAR HAD SHOWN THE NEED FOR THIS MOBILITY. FOR THE PURSUIT FORCE TO BE EFFECTIVE IT HAD TO BE ABLE TO MOBILIZE AND CONCENTRATE ITS FORCES RAPIDLY TO MEET AN OPPOSING THREAT WHEREVER THE THREAT CAME FROM. HENCE, IN THE EARLY 1920S, DEMONSTRATING STRATEGIC AND TACTICAL MOBILITY WAS IMPORTANT TO THE 1ST PURSUIT GROUP. THE FIRST LARGE DEPLOYMENT EXECUTED BY THE 1ST PG WAS THEIR MOVE FROM ELLINGTON FIELD, OUTSIDE OF HOUSTON, TEXAS TO SELFRIDGE, MICHIGAN. MAJ CARL SPAATZ, AS COMMANDER OF THE 1ST PURSUIT GROUP, LED THE GROUP'S MOVEMENT AND SUCCESSFULLY TRANSFERRED ALL 21 PLANES TO SELFRIDGE BY AIR.³⁴ SPAATZ SAW MOBILITY AS A CENTRAL KEY TO PURSUIT'S EFFECTIVENESS, AND TO THAT END, HE EXPERIMENTED WITH CONCEPTS FOR INCREASING THE RANGE OF PURSUIT AIRCRAFT. ONE IDEA THAT MET WITH GREAT SUCCESS WAS EXTERNAL FUEL TANKS. IN 1924, HE TESTED EXTERNAL DROPPABLE FUEL TANKS ON HIS BOEING THOMAS MORSE AIRCRAFT. SPAATZ WAS ELATED WITH THE SUCCESS OF THE TANKS AS THEY SUBSTANTIALLY INCREASED THE PLANE'S ENDURANCE TO OVER FIVE HOURS. THE DESIGN OF THE TANKS EVEN ENABLED THE PILOT TO JETTISON THEM ONCE THE FUEL WAS CONSUMED OR CONTACT WITH THE ENEMY WAS MADE.³⁵

BECAUSE MOBILITY WAS CRUCIAL TO PURSUIT, THE 1ST PURSUIT GROUP REGULARLY EXERCISED ITS ABILITY TO DEPLOY AND OPERATE A LARGE FORMATION ACROSS THE UNITED STATES. IN 1925 FOR INSTANCE, THE 1ST PG ATTEMPTED TO DEPLOY 12 PW-8S FROM SELFRIDGE, MICHIGAN TO MIAMI, FLORIDA IN A SINGLE DAY. ALTHOUGH THEY FAILED TO REACH FLORIDA IN A SINGLE DAY, DUE MAINTENANCE AND LEADERSHIP DECISIONS, THEY DID GET ALL 12 PW-8S TO FLORIDA WITH ONLY A SLIGHT DELAY.³⁶ THEIR DEPLOYMENT WAS SUCCESSFUL ENOUGH THAT GENERAL PATRICK, THE CHIEF OF THE AIR SERVICE, AVERRED THE FLIGHT "DEMONSTRATED THE PRACTICABILITY OF TRANSFERRING THE PURSUIT COMPONENT OF OUR AIR FORCE FROM THE COLD WEATHER OF THE EXTREME NORTHERN PART OF OUR COUNTRY TO THE WARMER SOUTHERN CLIMATE IN A SINGLE DAY."³⁷ SUBSEQUENT DEPLOYMENTS VERIFIED PATRICK'S CLAIM. TESTING THEIR ABILITY TO DEPLOY AND THEN OPERATE, THE 1ST PURSUIT GROUP DEPLOYED TO MITCHEL FIELD, NEW YORK, IN OCTOBER 1925 AND FAIRFIELD, OHIO, IN APRIL 1926. FOLLOWING BOTH DEPLOYMENTS, THE 1ST PURSUIT GROUP COMBINED WITH

³¹ Rebecca Hancock Cameron, *Training to Fly: Military Flight Training 1907-1945* (Washington, D.C.: Air Force History and Museums Program, 1999), 229.

³² "The Bombing Competition at Langley Field," *Air Service News Letter* X, no. 8 (24 May 1926): 5-6 and Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington, D.C.: Office of Air Force History, 1987), 77-78.

³³ "Selfridge Field, Mt. Clemens, Mich., March 16," *Air Service News Letter* X, no. 5 (5 April 1926): 24, and Maurer, 224.

³⁴ David R. Mets, *Master of Airpower: General Carl A. Spaatz* (Novato, Calif.: Presidio, 1988), 45-46.

³⁵ *Ibid.*, 48-49.

³⁶ The 1st Pursuit Group planned to depart early Saturday morning with stopovers at Fairfield, Ohio and Macon, Georgia. Landing at Fairfield, one of the pilots broke his landing gear. Rather than pressing forward with 11 aircraft, Maj Thomas Lanphier, the group commander, delayed the flight until a replacement could arrive. Two other planes experienced engine trouble, further delaying the flight to Macon. The flight reached Macon late Saturday afternoon, where Lanphier decided to wait rather than to fly at night into bad weather to get to Miami. General Patrick cited Lanphier's decision not to eliminate the problem aircraft and proceed with the remainder as the only reason the majority of the aircraft did not reach Miami in one day. Maurer, 77.

³⁷ Gen Mason Patrick, quoted in Maurer, 77.

ELEMENTS OF THE 2D BOMBARDMENT AND 3D ATTACK GROUPS FOR EXERCISES. IN THE OHIO EXERCISE, THE PURSUIT GROUP'S AIRCRAFT AND PILOTS FLEW OFFENSIVE MISSIONS PROTECTING FRIENDLY BOMBERS AND ATTACK AIRCRAFT AS WELL AS DEFENSIVE MISSIONS DEFENDING SIMULATED GROUND TROOPS FROM ATTACKS BY HOSTILE BOMBERS AND FIGHTERS.³⁸

OVERALL, TRAINING FOR THE 1ST PURSUIT GROUP IN THE EARLY 1920S REFLECTED THE NUMEROUS MISSIONS FORESEEN BY PILOTS. INDIVIDUALLY, PURSUIT PILOTS RECEIVED ADEQUATE TRAINING IN A WIDE ARRAY OF MISSION AREAS. WHERE THEY LACKED TRAINING WAS IN LARGE FORCE EMPLOYMENT. RARELY DID THE 1ST PG HAVE THE ASSETS TO FLY LARGE FORMATIONS. FURTHERMORE, THROUGHOUT THE 1920S, THE 1ST PG WAS PERENNIALY UNDERMANNED, ADDING TO ITS INABILITY TO MASS A LARGE FORMATION.³⁹ ONE AREA WHERE THE 1ST PG DID DEMONSTRATE PROFICIENCY WAS IN STRATEGIC MOBILITY. THE PURSUIT GROUP REPEATEDLY DEMONSTRATED ITS ABILITY TO MOBILIZE AND RAPIDLY CONCENTRATE ITS FORCES ACROSS THE COUNTRY, A COMPETENCY NECESSARY FOR PURSUIT GIVEN ITS PRIMARY MISSION OF DEFENDING THE ENTIRE CONTINENTAL UNITED STATES.

Signs of Decay

ALTHOUGH PURSUIT AVIATION REMAINED THE BASIC ARM OF AVIATION THROUGH THE AIR SERVICE YEARS, ITS INFLUENCE SLOWLY BEGAN TO DECAY AS THE INFLUENCE OF THE BOMBER GREW. THE RISE OF STRATEGIC BOMBING THEORY AFTER WORLD WAR I WAS DUE IN PART TO AVIATORS STRIVING FOR INDEPENDENCE FROM THE ARMY. IF THE FLEDGING AIR SERVICE WERE TO MATURE INTO AN INDEPENDENT ARM, AIRMEN NEEDED TO EITHER CREATE NEW ROLES UNIQUE TO AIRPOWER OR SEIZE EXISTING RESPONSIBILITIES FROM THE ARMY OR NAVY. AVIATORS ATTEMPTED TO DO BOTH BY DEMONSTRATING THE POTENCY OF AIRPOWER.⁴⁰ IN 1921, BRIG GEN WILLIAM MITCHELL STAGED A VIVID DISPLAY OF AIRPOWER, SINKING THE BATTLESHIP *OSTFRIESLAND*. BY DEMONSTRATING AIRPOWER'S ABILITY TO SINK THE LARGEST OF SHIPS, MITCHELL ACCOMPLISHED TWO THINGS CRITICAL TO STRATEGIC BOMBING DEVELOPMENT. FIRST, HE DEMONSTRATED THE POWER OF THE BOMBER. SECOND, AND MORE IMPORTANTLY, HE HELPED SECURE COASTAL DEFENSE AS AN AIR SERVICE MISSION. BY SECURING THE COASTAL DEFENSE MISSION, HE HELPED GUARANTEE THE DEVELOPMENT OF FUTURE BOMBERS AS A MEANS TO PROTECT THE US COASTS. COASTAL DEFENSE WAS BUT ONE PART OF THE LARGER AIR SERVICE MISSION OF STRATEGIC DEFENSE. FROM AN AIRMEN'S PERSPECTIVE, STRATEGIC DEFENSE DEMANDED OPERATING BEYOND THE OPERATING RADIUS OF THE ARMY AND NAVY, HITTING THE ENEMY WHERE IT WAS MOST VULNERABLE, AT ITS HOME. THUS, US AIRPOWER ADVOCATES LIBERALLY APPLIED STRATEGIC DEFENSE AS A BASIS UPON WHICH TO BUILD AN OFFENSIVE FORCE TAILORED TO STRATEGIC BOMBING.⁴¹

AS EARLY AS 1923, STRATEGIC BOMBING THEORY BEGAN TO TAKE ROOT AND THE BOMBER BEGAN TO GAIN FAVOR WITHIN THE AIR SERVICE. IN HIS RESPONSE TO THE LASSITER BOARD FINDINGS, GENERAL PATRICK, CHIEF OF THE AIR SERVICE, PROPOSED INCREASING THE PLANNED WARTIME AUTHORIZATION FOR BOMBER GROUPS SIX FOLD FROM 1 TO 6.⁴² HE SIMULTANEOUSLY ASKED TO INCREASE THE PURSUIT'S WARTIME AUTHORIZATION BY A SMALLER FRACTION FROM 14 TO 24 GROUPS. HE REASONED "WITH THE INCREASING IMPORTANCE OF ATTACKING ENEMY OBJECTIVES FAR BEHIND THE ENEMY LINES, SIX BOMBARDMENT GROUPS ARE CERTAINLY NO MORE THAN ADEQUATE."⁴³ THE NUMBER OF WARTIME GROUPS GENERAL PATRICK RECOMMENDED REFLECTS THE PRIORITY GIVEN TO PURSUIT IN EARLY 1920S; HOWEVER, HIS COMMENTS DISPLAY THE GROWING SENTIMENT WITHIN THE AIR SERVICE

³⁸ Maurer, 78-79 and "First Pursuit Group," *Air Service News Letter* X, no. 6 (16 April 1926): 20.

³⁹ Mets, *Master of Airpower*, 50.

⁴⁰ Lt Col Peter R. Faber, "Interwar US Army Aviation and the Air Corps Tactical School: Incubators of American Airpower," in *The Paths of Heaven: The Evolution of Air Power Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997), 191.

⁴¹ *Ibid.*, 193, 203.

⁴² General Patrick's number is what he envisioned would be necessary to adequately defend the United States and its possessions if a general war were to break out. It would require a massive build of both bomber and fighter forces.

⁴³ Maj Gen Mason M. Patrick, letter, 7 February 1923, 3d Ind. to *Report of a Committee of Officers Appointed by the Secretary of War* (Washington, D.C.: War Department, 22 March 1923), 4-5, AFHRA 145.93-102A.

THAT THE MISSION OF THE AIR FORCES SHOULD BE TO ATTACK DEEP BEHIND ENEMY LINES. DEEP ATTACK WAS IMPORTANT TO THE AIR SERVICE, BECAUSE IT WAS A NEW MISSION AND ONE UNIQUE TO AIRPOWER.

THE DELINEATION OF A UNIQUE AIR FORCE MISSION WAS CENTRAL TO THE SERVICE'S STRUGGLE FOR INDEPENDENCE. BECAUSE THE STRATEGIC BOMBER PROVIDED A MEANS TO GAIN THAT MISSION, IT BECAME THE FOCUS OF AIRMEN OVER PURSUIT AIRCRAFT. THE 1925 TO 1926 ASTS TEXT *EMPLOYMENT OF COMBINED AIR FORCE*, THE CAPSTONE COURSE AT THE SCHOOL, FIRST CODIFIED THE NOTION OF AN INDEPENDENT AIR FORCE MISSION AND INFERRED THAT THE AIR FORCE SHOULD BE ON EQUAL FOOTING WITH THE ARMY AND NAVY. COMPARED TO THE OFFICIAL DOCTRINE PUBLISHED IN THE 1926 TR 440-15, WHICH STATED, "THE MISSION OF THE AIR SERVICE IS TO **ASSIST** THE GROUND FORCES...",⁴⁴ THE FORWARD LOOKING ASTS TEXT STATED, "THE MISSION OF THE AIR FORCE IS TO **COOPERATE** WITH THE MILITARY AND NAVAL FORCES IN FURTHERANCE OF NATIONAL POLICY." (EMPHASIS ADDED)⁴⁵ THE TEXT SUPPORTED ITS CALL FOR EQUALITY NOTING THAT AIRPOWER OFFERED A CHEAPER AND EASIER WAY TO WIN WARS. IT ELABORATED, THE AIM OF WAR POLICY IS NOT TO DESTROY ENEMY ARMIES, BUT TO DESTROY THE ENEMY'S MORALE AND WILL TO RESIST. ANY MEANS CAN ACCOMPLISH THIS TASK TO INCLUDE STRIKING THE OPPOSING ARMY, BUT THE BEST MEANS MAY BE STRATEGIC ATTACK ON THE ENEMY'S INTERIOR. THE TEXT ARGUED THAT AIRPOWER IS "A METHOD OF IMPOSING WILL BY TERRORIZING THE WHOLE POPULATION OF A BELLIGERENT COUNTRY WHILE CONSERVING LIFE AND PROPERTY TO THE GREATEST EXTENT. IT IS A MEANS OF IMPOSING WILL WITH THE LEAST POSSIBLE LOSS BY HEAVILY STRIKING VITAL POINTS RATHER THAN WEARING DOWN AN ENEMY TO EXHAUSTION."⁴⁶ THE CONCLUSION ONE DRAWS FROM THE *EMPLOYMENT OF COMBINED AIR FORCE* TEXT IS INESCAPABLE: AIRPOWER COULD ELIMINATE THE NEED FOR A WORLD WAR I STYLE WAR OF ATTRITION. THEREFORE, AIRMEN ARGUED, THE AIR SERVICE DESERVED ITS INDEPENDENCE BECAUSE STRATEGIC ATTACK HAD PROVIDED IT WITH A UNIQUE, WAR-WINNING STRATEGY.

LOGICALLY, THEREFORE, IF STRATEGIC BOMBING WAS THE MEANS FOR AIRPOWER TO WIN WARS, IT SHOULD BE THE CORE MISSION OF THE AIR FORCE. LIKewise, THE STRATEGIC BOMBER SHOULD BE THE BASIC ELEMENT OF THE AIR FORCE.

THAT REALIZATION PAVED THE WAY FOR A SIGNIFICANT CHANGE IN AIR SERVICE THINKING. IF THE PRIMARY MISSION OF AIRPOWER WAS STRATEGIC BOMBING, THEN BY DEFAULT, PURSUIT AVIATION WAS PURELY A SUPPORT MISSION. SHERMAN, IN HIS 1926 BOOK *AIR WARFARE*, EXPANDED THIS REALIZATION TO ALL ACTIVITIES OF THE AIR SERVICE. HE NOTES, PURSUIT AVIATION "IS OF IMPORTANCE ONLY TO THE EXTENT IT AFFECTS THE OPERATION OF ATTACK, BOMBARDMENT, AND OBSERVATION AVIATION. IF WE IMAGINE A SITUATION WHERE THE ENEMY HAS NO AVIATION, OUR OWN AVIATION, WITH THE EXCEPTION OF PURSUIT, IS GREATLY ENHANCED IN VALUE, WHEREAS OUR PURSUIT AVIATION WOULD BE USELESS AS SUCH." THUS, SHERMAN NOTED THE DILEMMA THAT ALTHOUGH PURSUIT AVIATION IS "THE VERY BACKBONE OF THE AIR FORCE," IT IS ALSO PARADOXICALLY "AUXILIARY TO THE OTHER BRANCHES OF AVIATION."⁴⁷ THE ACCEPTANCE OF PURSUIT AS AN AUXILIARY FORCE WAS THE FIRST STEP IN THE DOWNFALL OF PURSUIT. HOWEVER, UNTIL THE BOMBER ADVOCATES COULD PROVE FIGHTERS WERE UNNECESSARY TO ACCOMPLISH THEIR MISSION, PURSUIT WOULD REMAIN KING. THE TECHNOLOGICAL ADVANCES IN THE YEARS THAT FOLLOWED SHORTLY THEREAFTER UNDER THE AIR CORPS SEEMINGLY PROVIDED THAT PROOF.

⁴⁴ WDTR 440-15, 26 January 1926, 1.

⁴⁵ Air Service Tactical School (ASTS), *Employment of Combined Air Force* (Langley Field, Va.: Air Service Tactical School, 1925-1926), 1, AFHRA 248.101-7A.

⁴⁶ *Ibid.*, 3.

⁴⁷ Sherman, 119.

Chapter 2

Battle with the Bombers: 1926 to 1935

"AIR SUPERIORITY" AND "CONTROL OF THE AIR" ARE TERMS WHICH MEAN NOTHING AS FAR AS ULTIMATE SUCCESS OR SECURITY IS CONCERNED, UNLESS THEY COMPREHEND THE COMPLETE DEFEAT OF THE HOSTILE AIR FORCE. A SUPERIOR FORCE CANNOT GUARANTEE IMMUNITY FROM AIR ATTACK, THUS THESE TERMS CAN APPLY ONLY TO LOCALIZED SPACE AND BRIEF PERIODS OF TIME, AS LONG AS THE HOSTILE AIR FORCE IS ABLE TO OPERATE OFFENSIVELY.

*- BRIG GEN C. E. KILBOURNE
21 DECEMBER 1934*

WHILE THE AIR SERVICE YEARS MARKED THE HEYDAY OF PURSUIT AVIATION, THE AIR CORPS YEARS SIGNALLED A PRECIPITOUS DECLINE IN PURSUIT AVIATION. PURSUIT AVIATION LOST ITS IMPORTANCE AND AIRMEN TRANSFORMED ITS MISSION PLACING ALMOST EXCLUSIVE EMPHASIS ON DEFENSIVE ROLES. SEVERAL FACTORS INFLUENCED THE DECLINE OF PURSUIT AVIATION, BUT NONE MORE SO THAN THE RISE OF THE BOMBER. IN THE END, THE AIR CORPS PROVED UNABLE TO BALANCE BETWEEN THE TWO AND FOCUSED ON THE BOMBER TO THE DETRIMENT OF PURSUIT AVIATION. THE SHIFT FROM PURSUIT TO BOMBERS IS NOWHERE MORE OBVIOUS THAN THE FORCE STRUCTURE OF THE AIR CORPS. BY 1936 BOMBERS OUTNUMBERED FIGHTERS 11:9, HAVING REVERSED THE FORCE STRUCTURE FROM THE EARLY TWENTIES WHERE PURSUIT AIRCRAFT OUTNUMBERED BOMBERS 4:1.¹

EVIDENCE OF THE CONFLICT ALSO EMERGED IN AIR CORPS DOCTRINE AS IT SHIFTED FROM PURSUIT CENTRIC EMPLOYMENT TO EMPLOYMENT BASED UPON STRATEGIC BOMBING. BECAUSE THE AIR CORPS TACTICAL SCHOOL (ACTS) WAS THE CENTRAL AIR DOCTRINE CENTER, MUCH OF THE FIGHT OCCURRED ON ITS CAMPUS AT MAXWELL FIELD. ADDITIONALLY, NEW TECHNOLOGIES AND AERIAL MANEUVERS ALSO SUPPORTED THE EFFICACY OF STRATEGIC BOMBARDMENT AND ADDED WEIGHT TO THE ACTS'S THEORIES. AS STRATEGIC BOMBARDMENT THEORY SOLIDIFIED, THE FIGHT BETWEEN PURSUIT AND BOMBERS BECAME MORE INTENSE AND PERSONAL UNTIL EVENTUALLY THE BOMBER ADVOCATES WON THE DEBATE BY SILENCING PURSUIT ADVOCATES.

BROADER STRATEGIC ISSUES ALSO AFFECTED THE INTERNAL AIR CORPS DEBATE BETWEEN BOMBERS AND FIGHTERS. NATIONAL POLICY FAVORED A DEFENSIVE FORCE AND CHANNLED FIGHTER DEVELOPMENT TOWARDS THE DEFENSIVE ROLE. MONEY WAS ALSO A FACTOR. AFTER EXPERIENCING SEVERAL GOOD YEARS OF GROWTH WITH THE FIVE-YEAR PLAN ENACTED AS A RESULT OF THE AIR CORPS ACT, THE GREAT DEPRESSION TOOK ITS TOLL ON BOTH THE AIR CORPS AND PURSUIT AVIATION ALIKE. THE TIGHTENING OF THE PURSE STRINGS RESTRICTED DEVELOPMENT AND PROCUREMENT OF PURSUIT AIRCRAFT AND HELPED BOMBER ADVOCATES GAIN TRACTION ARGUING THAT PURSUIT AIRCRAFT WERE SUPERFLUOUS. THE NET EFFECT WAS TO CHANNEL PURSUIT AVIATION INTO A DEFENSIVE FORCE. ITS DOCTRINE, TRAINING, AND EQUIPMENT REFLECTED THE DEFENSIVE MINDSET. FURTHER, SPURRED BY SUBORDINATION TO BOMBARDMENT, PURSUIT AIRCRAFT DEVELOPMENT LAGGED BEHIND BOMBER DEVELOPMENT; SETTING UP A CONCURRENT DECLINE IN PURSUIT CAPABILITY.

The Air Corps Tactical School and Its Influence

THE AIR CORPS TACTICAL SCHOOL (ACTS) AT MAXWELL FIELD, ALABAMA STOOD AT THE CENTER OF THE BOMBING DEBATE. ESTABLISHED TO TRAIN OFFICERS FOR COMMAND AND STAFF DUTIES, ACTS ALSO DEVELOPED NEW IDEAS ON DOCTRINE AND TACTICS.² LIEUTENANT COLONEL JOHN F.

¹ Maj Gen Oscar Westover, chief of Air Corps, address before the National Aeronautic Association Meeting, Chicago, Il., 30 November 1936, AFHRA 248.211-71.

² The Air Corps Tactical School moved from Langley Field, Virginia to Alabama in 1931. It was the evolution of the Air Service Field Officers' School, which later became the Air Service Tactical School.

CURRY, THE ACTS COMMANDANT IN 1932, SOLIDIFIED ACTS ROLE AS A DEVELOPMENT CENTER FOR AIR DOCTRINE. HE SUGGESTED TO THE CHIEF OF THE AIR CORPS THAT ACTS BE A "CLEARING-HOUSE INTO WHICH TACTICAL IDEAS CAN FLOW, WHERE THEY CAN BE TRIED AND WHERE THE DOCTRINE CAN GO OUT TO THE SERVICE TO BE PUT INTO PRACTICE AND BE EVALUATED."³ CURRY'S VISION TOOK ROOT AND ACTS BECAME THE HUB OF AIR POWER ADVOCACY AND INDOCTRINATION.

THE IMPACT OF ACTS INFLUENCE WAS TWOFOLD. FIRST, IT DEVELOPED DOCTRINE AND TACTICS FOR THE AIR CORPS. ACTS LESSONS FORMED THE BASIS FOR TRAINING IN THE TACTICAL UNITS, WHILE ITS THEORIES SERVED AS UNOFFICIAL DOCTRINE FOR THE AIR CORPS.⁴ A 1ST PURSUIT GROUP OFFICER NOTED IN 1932, "THE TEACHINGS OF THE AIR CORPS TACTICAL SCHOOL IN TACTICS AND IN TYPES OF FORMATIONS ARE BEING TRIED OUT IN AN ENDEAVOR TO ASCERTAIN THE MERITS OF THE PRESCRIBED FORMATIONS AND TACTICS, AND HOW THE TEACHINGS OF THE TEXT MAY BE APPLIED TO ACTUAL CONDITIONS IN THE AIR."⁵ FURTHERMORE, IN RESPONSE TO A 1939 SURVEY, AIR CORPS PURSUIT UNITS ACROSS THE BOARD RESPONDED THAT THEY EMPLOYED PURSUIT IN ACCORDANCE WITH THE ACTS'S PURSUIT TEXT. NONE OF THE UNITS VISUALIZED A PHASE OF PURSUIT EMPLOYMENT OUTSIDE OF THE TEXTBOOK'S DESCRIBED MISSIONS.⁶ IN ALL, ALTHOUGH UNOFFICIAL, THE IDEAS AT ACTS DIRECTLY INFLUENCED THE PURSUIT PILOT IN THE FIELD. THE PURSUIT PILOTS CLOSELY FOLLOWED THE IDEAS AND CONCEPTS OF EMPLOYMENT DICTATED BY ACTS, MORE OR LESS ACCEPTING ACTS TEACHINGS AS DOCTRINE.

THE SECOND EFFECT OF ACTS ON PURSUIT AVIATION, HOWEVER, WENT BEYOND DOCTRINE. ACTS'S TEACHINGS PERMEATED THE LEADERSHIP OF THE US ARMY AIR FORCES (USAAF) AND THEREFORE SHAPED THE EMPLOYMENT OF AIRPOWER IN WORLD WAR II. IN THE WORDS OF ONE HISTORIAN, "AIR DOCTRINE EMERGED DURING THE 1930'S AT THE HANDS OF A GROUP OF YOUNG CAPTAINS AND MAJORS WHO MADE UP THE ACTS FACULTY AND WHOSE NAMES FORM A KIND OF ROSTER OF THE ARMY AIR FORCES' HIGH COMMAND DURING THE SECOND WORLD WAR."⁷ IN ADDITION TO THE FACULTY OF ACTS, A LARGE NUMBER OF ITS GRADUATES BECAME GENERAL OFFICERS DURING WORLD WAR II. OF THE 320 GENERAL OFFICERS IN THE AAF AT THE END OF WORLD WAR II, 261 WERE ACTS GRADUATES. OF PARTICULAR NOTE, TWO THIRDS OF THE OFFICERS GRADUATED FROM ACTS IN THE FINAL FIVE YEARS BEFORE THE WORLD WAR II WHEN ACTS TAUGHT STRATEGIC BOMBARDMENT AS THE PRIMARY FOCUS OF AIRPOWER AND GAVE LITTLE ATTENTION TO PURSUIT AVIATION BEYOND ITS DEFENSIVE ROLE OF PROTECTING THE UNITED STATES.⁸

IN SHORT, IT WOULD BE DIFFICULT TO UNDERESTIMATE THE IMPORTANCE OF ACTS. WHILE THERE MAY HAVE BEEN OTHER IDEAS CIRCULATING IN THE AIR CORPS, CLEARLY ACTS WAS THE MOST INFLUENTIAL ORGANIZATION ON AIR CORPS DOCTRINE. THEREFORE UNDERSTANDING THE DOCTRINE THAT EMERGED FROM ACTS IS NECESSARY TO GRASP THE BATTLE BETWEEN BOMBER AND PURSUIT ADVOCATES.

The Air Service Field Officers' School set out to accomplish three things: "1) train officers to become competent commanders and staff officers of air units up to and including an air brigade and army air service; 2) teach these same officers air tactics; and 3) *originate sound tactical doctrine for the Air Service as a whole* (emphasis in original)." From Lt Col Peter R. Faber, "The Development of US Strategic Bombing Doctrine in the Interwar Years: Moral and Legal?" *Journal of Legal Studies*, 7, 1996/1997, n.p., on line, Internet 24 April 2005, available from <http://atlas.usafa.af.mil/dfl/documents/morleg.doc>.

³ Lt Col John F. Curry, quoted in David E. Johnson, *Fast Tanks and Heavy Bombers* (Ithaca, N.Y.: Cornell University Press, 1998), 155.

⁴ The Air Corps treated Air Corps Tactical School texts and academics like doctrine, but they were not doctrine, because, as a branch of the Army, the Air Corps could not publish official doctrine. Only the Army could publish official doctrine.

⁵ "Training of the First Pursuit Group," *Air Corps News Letter* XVI, no. 5 (3 May 1932): 158.

⁶ Maj James E. Parker, Chief of Pursuit Section ACTS, memorandum, subject: Pursuit Questionnaire, 1939, AFHRA 248.282.

⁷ William R. Emerson, "Operation POINTBLANK: A Tale of Bombers and Fighters," Harmon Memorial Lecture, United States Air Force Academy, Colo., 27 March 1962, 448.

⁸ Robert T. Finney, *History of the Air Corps Tactical School 1920-1940* (1955, reprint Maxwell AFB, Ala.: Air Force History and Museums Program, 1998), 42-43 and Faber, "The Development of US Strategic Bombing Doctrine," n.p.

The ACTS Debate

THE CONFLICT BETWEEN PURSUIT AVIATION AND BOMBARDMENT GREW OUT OF THE DESIRE OF BOMBARDMENT ADVOCATES TO ESTABLISH STRATEGIC BOMBING AS THE OPTIMUM UTILIZATION OF AIRPOWER. THOSE ADVOCATES ARGUED THAT NOT ONLY COULD STRATEGIC BOMBING REDUCE THE COSTS OF WAR, BUT ITS ACCEPTANCE WOULD ALSO PROVIDE THE AIR CORPS WITH A VALID ARGUMENT FOR INDEPENDENCE. HOWEVER, FOR STRATEGIC BOMBING TO BE SUCCESSFUL, AMONG OTHER THINGS, THE BOMBERS HAD TO BE ABLE TO GET TO THEIR TARGETS AND BACK IN THE FACE OF HOSTILE ENEMY FIGHTERS. IN THE EARLY 1930S, WITH THE INTRODUCTION OF THE MARTIN B-10 BOMBER, THE RANGE OF BOMBERS GROSSLY OUTSTRIPPED THE RANGE OF PURSUIT AIRCRAFT AND THE SPEEDS BECAME CLOSER.⁹ BECAUSE THE BOMBERS OUT RANGED THE PURSUIT AIRCRAFT, IF THE AIR CORPS WANTED TO USE BOMBERS AT MAXIMUM RANGE, THE BOMBERS NEEDED TO BE ABLE TO EMPLOY WITHOUT THE SUPPORT OF PURSUIT ESCORT; HENCE, THEY NEEDED TO BE ABLE TO DEFEND THEMSELVES AGAINST AN ENEMY AIR ATTACK. THIS BECAME THE CENTRAL ARGUMENT BETWEEN PURSUIT AND BOMBER ADVOCATES. BOMBER ADVOCATES ARGUED THAT BOMBERS WOULD GET THROUGH WITHOUT ESCORT. THE 1930 ACTS TEXT, *THE AIR FORCE*, STATED BOMBARDMENT'S POSITION. "A STRONG HOSTILE FORMATION OF BOMBARDMENT OR ATTACK IS LIKELY TO REACH ITS OBJECTIVE BEFORE BEING INTERCEPTED AND ATTACKED BY OUR PURSUIT. EVEN IF ATTACKED, UNLESS BY OVERWHELMING NUMBERS, IT IS LIKELY TO REACH ITS OBJECTIVE."¹⁰ LIEUTENANT KENNETH WALKER, AN ACTS INSTRUCTOR FROM 1929 TO 1933, SUMMED UP THE NOTION AVERRING, "A WELL-ORGANIZED, WELL-PLANNED, AND WELL-FLOWN AIR FORCE ATTACK WILL CONSTITUTE AN OFFENSIVE THAT CANNOT BE STOPPED."¹¹

THIS IDEA SERVED AS THE CENTRAL ARGUMENT FOR THE BOMBER ADVOCATES. THEY ARGUED THAT HIGH-SPEED, HEAVILY ARMED BOMBERS FLYING IN FORMATION COULD DEFEAT OR AT LEAST SURVIVE ANY ATTACKS BY DEFENSIVE PURSUIT FIGHTERS. PURSUIT ADVOCATES, ON THE OTHER HAND, ARGUED UNESCORTED BOMBERS WOULD BE AT THE MERCY OF PURSUIT AVIATION.

THE BELIEF THAT THE BOMBER WOULD GET THROUGH WITHOUT PURSUIT ESCORT DEMANDED A RETHINKING OF THE BASIC NOTION OF AIR SUPERIORITY. IN EFFECT, BOMBER ADVOCATES ARGUED THAT AIR SUPERIORITY WAS NOT A REQUISITE FOR SUCCESSFUL AIR OPERATIONS. THEY CONTENDED THAT IT WOULD SELDOM BE PRACTICAL TO CLEAR THE AIR OF ENEMY PURSUIT BEFORE EXECUTING OFFENSIVE STRIKES. FURTHERMORE, BECAUSE THEY BELIEVED PURSUIT TO BE INCAPABLE OF INTERCEPTING AND DESTROYING BOMBERS, THEY MAINTAINED THAT PURSUIT COULD NOT GAIN CONTROL OF THE AIR. HENCE, THEY SURMISED, ONLY BOMBARDMENT COULD GAIN CONTROL OF THE AIR BY DESTROYING THE ENEMY AIR FORCE ON THE GROUND. IMPROVEMENTS IN THE BOMBERS ALLOWED THEM TO FLY PAST THE AIRBORNE ENEMY PURSUIT ENROUTE TO THE ENEMY'S AERODROMES, ALLOWING THEM TO DEFEAT THE HOSTILE FORCES BY BOMBING THEM ON THE GROUND.¹² HENCE, THE BOMBER ADVOCATES DID NOT DISAVOW AIR SUPERIORITY COMPLETELY. INSTEAD, THEY ARGUED UNESCORTED BOMBERS WOULD ATTAIN AIR SUPERIORITY BY STRIKING THE ENEMY'S AIRFIELDS.

PURSUIT ADVOCATES, ON THE OTHER HAND, MAINTAINED THAT AIR SUPREMACY, ACHIEVED IN THE AIR, WAS A PREREQUISITE FOR SUCCESS, MUCH AS IT HAD BEEN IN WORLD WAR I AND THAT AIR SUPREMACY REQUIRED PURSUIT TO GAIN CONTROL OF THE AIR. THEY RELIED ON THE THEORY DERIVED IN THE 1920S AS EXPLAINED BY BILLY MITCHELL: "CONTROL... IS OBTAINED BY THE AIR BATTLES OF PURSUIT AVIATION." THE PRIMARY METHOD FOR PURSUIT TO GAIN CONTROL WAS NOT TO CLEAR AN AREA, BUT TO DESTROY THE ENEMY'S AIR.¹³ AS SUCH, PURSUIT ADVOCATES STAUNCHLY MAINTAINED

⁹ The B-10's range was 1370 miles, compared to the P-26, which had a range of only 360 miles. The B-10 could fly at 215 mph, while the P-26 topped out at 234 mph. National Museum of the USAF, "Virtual Aircraft Gallery," on-line, Internet, 7 May 2005, available from <http://www.wpafb.af.mil/museum/ind/ind.htm>.

¹⁰ Air Corps Tactical School *The Air Force*, (Maxwell Field, Ala.: Air Corps Tactical School, April 1930), AFHRA 248.101-1, 73.

¹¹ Lt Kenneth N. Walker, quoted in Martha Byrd, *Kenneth N. Walker: Airpower's Untempered Crusader* (Maxwell AFB, Ala.: Air University Press, 1997), 37.

¹² Finney, *History of ACTS*, 73, 74 and Byrd, *Walker*, 27.

¹³ William Mitchell, quoted in Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm 1917-1941* (1955; reprint, Washington, D.C.: Office of Air Force History, 1985), 31-37.

THE NEED FOR PURSUIT ESCORT, AND CAUTIONED THAT BOMBARDMENT SHOULD OPERATE ONLY WITHIN THE RANGE OF FRIENDLY PURSUIT ESCORT.

DURING THE DEBATE HOWEVER, PURSUIT ADVOCATES DID YIELD SOMEWHAT TO THE CALLS OF THE BOMBARDMENT ADVOCATES. SPECIFICALLY, PURSUITERS ACKNOWLEDGED THE BOMBARDIERS' CLAIM THAT PURSUIT WAS NO LONGER THE CENTRAL FUNCTION OF THE AIR FORCE. CAPT CLAIRE L. CHENNAULT, THE MOST VOCAL ADVOCATE OF FIGHTER AVIATION AT ACTS, NOTED THAT ALTHOUGH PURSUIT WAS ESSENTIAL FOR MISSION ACCOMPLISHMENT, IT WAS "DECISIVE ONLY WHEN EXPLOITED BY OTHER FORCES." HE CONTINUED, "BOMBARDMENT MISSIONS WILL BE OF THE UTMOST IMPORTANCE AND PURSUIT WILL COOPERATE TO THE LIMIT OF ITS RANGE IN EXECUTING THESE MISSIONS."¹⁴

THIS RECOGNITION OF PURSUIT'S SUBORDINATION TO BOMBARDMENT LED TO A CHANGE IN PURSUIT EMPLOYMENT. SPECIFICALLY, IF THE MOST IMPORTANT MISSION OF AN AIR FORCE WAS BOMBARDMENT, THEN HOSTILE BOMBARDMENT AIRCRAFT, NOT PURSUIT, SHOULD BE THE TARGET OF FRIENDLY PURSUIT AIRCRAFT. CAPT MICHAEL MULCAHY NOTED IN HIS 1928 ACTS THESIS, "PURSUIT'S DESTRUCTION OF ENEMY PURSUIT IN THE AIR IS INCIDENTAL TO THE ACCOMPLISHMENT OF ITS MISSIONS; NEUTRALIZATION OF ENEMY PURSUIT IS ALL THAT IS NECESSARY. ONLY IN DEFENDING AGAINST HOSTILE BOMBARDMENT, ATTACK OR OBSERVATION DOES ITS MISSION REQUIRE IT TO DESTROY ENEMY AIRCRAFT IN FLIGHT."¹⁵ MULCAHY'S THESIS SYMBOLIZED THE AIR CORPS' NEW CONCEPT OF AIR SUPERIORITY. NO LONGER WAS ATTAINING AIR SUPERIORITY THE MISSION OF PURSUIT. THE MISSION OF PURSUIT WAS TO PROTECT THE FRIENDLY ASSETS ON THE GROUND OR IN THE AIR, NOT TO DESTROY ENEMY AIRCRAFT. IN BROADER TERMS, PURSUIT'S MISSION HAD CHANGED FROM OFFENSIVE; GAINING AIR SUPERIORITY, TO DEFENSIVE, DENYING THE ENEMY AIR SUPERIORITY. THIS CHANGE IN THE CONCEPT OF PURSUIT EMPLOYMENT HAD DRASTIC IMPACT ON THE DEVELOPMENT OF PURSUIT AVIATION AS EQUIPMENT, TRAINING AND TACTICS SHIFTED TOWARDS A DEFENSIVE ORIENTATION.

THIS ROLE CHANGE FOR PURSUIT ENTAILED A MAJOR CHANGE IN THE CONCEPT OF AIR SUPERIORITY AS WELL. IF PURSUIT AIRCRAFT DID NOT PROVIDE AIR SUPERIORITY, THEN EITHER ONE COULD ACCEPT A LOSS OF AIR SUPERIORITY OVER ENEMY TERRITORY OR FIND AN ALTERNATIVE SOLUTION. THE AIR CORPS ACCEPTED A SOLUTION COVERING BOTH OPTIONS. THE AIR CORPS THEORIZED THAT BOMBERS DID NOT NEED AIR SUPERIORITY; THEY COULD GET TO THE TARGET WITHOUT IT. UPON REACHING THEIR TARGETS, BOMBERS COULD GENERATE THEIR OWN AIR SUPERIORITY BY BOMBING ENEMY AIRFIELDS AND AIRCRAFT PRODUCTION. THEY ARGUED THEY WOULD BREAK THE WILL OF THE ENEMY TO FIGHT, WHILE AT THE SAME TIME DESTROYING HIS MEANS TO RESIST IN THE AIR. THE KEY TO THIS METHOD, HOWEVER, RESIDED ON THE BOMBERS' ABILITY TO GET TO THE TARGET. TECHNOLOGICAL ADVANCES IN BOMBARDMENT AIRCRAFT SEEMINGLY ENSURED BOMBERS THE ABILITY TO GET TO THE TARGET BY NEGATING THE EFFECTIVENESS OF HOSTILE PURSUIT AIRCRAFT AGAINST THEM.

The Effect of Technology

TECHNOLOGY PLAYED AN IMPORTANT ROLE IN THE BOMBER-FIGHTER DEBATE DURING THE EARLY 1930S AS BOMBERS GAINED A MOMENTARY TECHNOLOGICAL EDGE THAT PURSUIT AIRCRAFT SIMPLY COULD NOT OVERCOME. SINCE WORLD WAR I, THE GREATER FUEL LOADS OF THE BOMBERS ALLOWED THEM TO OUTRANGE PURSUIT AIRCRAFT, BUT PURSUIT AIRCRAFT STILL HELD A DISTINCT SPEED ADVANTAGE. IN THE 1930S, TECHNOLOGICAL ADVANCES ALLOWED BOMBERS SPEEDS TO APPROACH THOSE OF EXISTING PURSUIT AIRCRAFT. THE MAJOR BREAKTHROUGH IN SPEED OCCURRED IN THE EARLY 1930S WITH THE INTRODUCTION OF THE MARTIN B-10, AN ALL-METAL MONOPLANE BOMBER WITH RETRACTABLE GEAR. THE B-10'S TOP SPEED OF 215 MILES PER HOUR WAS ONLY SLIGHTLY SLOWER THAN THE FASTEST PURSUIT AIRCRAFT, THE BOEING P-26. THE P-26 SPORTED A TOP SPEED OF ONLY 234 MILES PER HOUR.¹⁶ WITH THE B-10, BOMBERS COULD FLY NEARLY AS FAST AS PURSUIT AIRCRAFT, MAKING INTERCEPTIONS MORE DIFFICULT AND LESS LIKELY. THESE CHANGES GAVE BOMBER ADVOCATES ADDED CONFIDENCE IN THEIR UNESCORTED BOMBER THEORY BECAUSE THEY THEORIZED PURSUIT

¹⁴ Capt Claire L. Chennault, quoted in Martha Byrd, *Chennault: Giving Wings to the Tiger* (Tuscaloosa, Ala.: University of Alabama Press, 1987), 50.

¹⁵ Capt Michael Mulcahy, "Two Seater Pursuit" (thesis, Air Corps Tactical School, 1928), n.p., AFHRA 248.282-11.

¹⁶ National Museum of the USAF, "Virtual Aircraft Gallery," on-line, Internet, 7 May 2005, available from <http://www.wpafb.af.mil/museum/ind/ind.htm>.

FIGHTERS COULD NOT CATCH THEM, AND IF THEY DID, THE ENGAGEMENTS WOULD BE SO FLEETING AS TO BE INEFFECTUAL.¹⁷

ALTHOUGH THE AIR CORPS DEVELOPED THE P-26 AND THE B-10 AT THE SAME TIME, THE FIGHTER TECHNICALLY LAGGED THE BOMBER'S DESIGN. FOR A VARIETY OF REASONS, ENGINEERS DESIGNED THE P-26 WITHOUT INCORPORATING THE LATEST TECHNOLOGY, WHICH WOULD HAVE GIVEN THE P-26 A DECISIVE ADVANTAGE OVER THE B-10.¹⁸ AS IT WAS, THE P-26 WAS NOT NEARLY AS STREAMLINED AS THE B-10; IT HAD AN INEFFICIENT COWLING, FIXED GEAR, A BRACED WING AND AN OPEN COCKPIT.¹⁹ IN SHORT, THE P-26, WHICH WAS THE AIR CORPS' FRONTLINE FIGHTER FOR MOST OF THE 1930S, WAS ALREADY OBSOLETE RELATIVE TO UNITED STATES BOMBERS WHEN IT WAS INTRODUCED.

BESIDES DESIGN CHOICES, PURSUIT DESIGN IN GENERAL LAGGED BOMBER DEVELOPMENT BECAUSE CIVILIAN APPLICATIONS HELPED ADVANCE LARGE AIRCRAFT TECHNOLOGY. TWO EVENTS PROPELLED THE ACCELERATION OF THE COMMERCIAL MARKET. THE FIRST WAS THE 1926 AIR COMMERCE ACT THAT REQUIRED THE POST OFFICE TO CONTRACT WITH PRIVATE ENTERPRISE FOR AIRMAIL. THE SECOND WAS CHARLES LINDBERGH'S CROSSING OF THE ATLANTIC. THE AIR COMMERCE ACT STIMULATED COMMERCIAL AVIATION WITH CAPITAL WHILE LINDBERGH "SET OFF A HUGE SURGE OF INTEREST IN FLYING." PAYING PASSENGERS INCREASED FROM FEWER THAN 9,000 IN 1927 TO 385,000 IN 1930.²⁰ AIRMAIL AND PAYING PASSENGERS PROVIDED THE MOTIVE FORCE TO SPUR DEVELOPMENT OF LARGE AIRCRAFT TECHNOLOGY. THIS TECHNOLOGY, WITH THE EXCEPTION OF ENGINES, SPILLED OVER PRIMARILY TO BOMBARDMENT AIRCRAFT. CAPTAIN MCCORMICK IN HIS 1938 ACTS THESIS NOTED, "BOMBARDMENT AIRCRAFT, NEEDING SOME OF THE SAME GENERAL CHARACTERISTICS AS THE LARGE COMMERCIAL TRANSPORT, WAS [SIC] ABLE TO MAKE GREAT ADVANCES IN QUALITY OF EQUIPMENT, PARALLELING THE STRIDES MADE IN THE COMMERCIAL FIELD. PURSUIT, OF ALL MILITARY AIRCRAFT, BENEFITED THE LEAST FROM THIS, AS IT HAS NO VALUE EXCEPT AS A MILITARY WEAPON."²¹ THE EFFECT OF THE COMMERCIAL DEVELOPMENT OF LARGE PLANES WAS THAT A TECHNOLOGY GAP DEVELOPED BETWEEN US FIGHTERS AND BOMBERS IN THE 1930S. THIS GAP PROVED TO BE A DECISIVE FACTOR IN DECIDING THE BOMBER VERSUS FIGHTER DEBATE.

AS BOMBER TECHNOLOGY PUSHED AHEAD OF PURSUIT TECHNOLOGY, AVIATORS ASSUMED THAT THE TREND WOULD CONTINUE. HENCE, VISIONS OF EVEN MORE POWERFUL BOMBERS, LED BOMBER ADVOCATES TO BELIEVE FUTURE BOMBERS WOULD CONTINUE TO OUTCLASS PURSUIT AVIATION. THE 1935 INTRODUCTION OF THE B-17 CEMENTED THE BELIEF IN THE SUPERIORITY OF THE BOMBER. IN ITS INAUGURAL FLIGHT FROM SEATTLE TO DAYTON, THE BOMBER AVERAGED 252 MILE PER HOUR, 17 MILES PER HOUR FASTER THAN THE TOP SPEED OF THE AIR CORPS FRONT LINE FIGHTER, THE P-26.²² A YEAR LATER, PURSUIT AVIATION CAUGHT UP WITH BOMBER DESIGNS WITH THE INTRODUCTION OF THE SEVERSKY P-35 AND THE CURTISS P-36. THE PLANES WERE THE "FIRST TRULY MODERN FIGHTERS TO EMERGE FROM AMERICAN FACTORIES." THEY INCORPORATED THE SAME ADVANCES THAT HAD PRODUCED THE FAST ALL-METAL MONOPLANE BOMBERS INTRODUCED SIX YEARS PRIOR, CREATING A FIGHTER THAT ONCE AGAIN SURPASSED THE PERFORMANCE OF THE BOMBER, SPORTING A TOP SPEED AROUND 300 MILES PER HOUR.²³

THE NEW FIGHTERS, HOWEVER, ARRIVED TOO LATE TO HAVE AN IMPACT ON THE THINKING IN THE AIR CORPS. BY 1936, THE DEBATE WAS ALL BUT OVER. THE BOMBER ADVOCATES HAD WON. BASING THEIR ARGUMENT ON CURRENT AIRCRAFT PERFORMANCE, BOMBER ADVOCATES CONTENDED THAT FUTURE BOMBERS WOULD EXCEED THE PERFORMANCE OF FIGHTERS. THE FALLACY OF THEIR

¹⁷ Stephen Budiansky, *Air Power* (New York, N.Y.: Viking, 2004), 184.

¹⁸ For instance, the P-26 had fixed gear because designers did not believe the gains of retractable gear would offset the weight and complexity. Its wing sported external braces, because designers felt the loads of pursuit aircraft were too great for a cantilevered wing like the B-10's. Finally, some pursuit pilots felt a closed cockpit would reduce visibility and the alertness of pilots.

¹⁹ Lt Col Phillip S. Meilinger, "The Impact of Technology and Design Choice on the Development of US Fighter Aircraft," *Journal of American Aviation Historical Society*, Spring 1991, 64.

²⁰ Budiansky, *Air Power*, 159-161.

²¹ Capt Harlan T. McCormick, "History and Development of Pursuit Aviation" (Maxwell Field, Ala.: thesis, Air Corps Tactical School, 1938), 12, AFHRA 248.282-36.

²² Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington, D.C.: Office of Air Force History, 1987), 354.

²³ Budiansky, *Air Power*, 197.

ARGUMENT STEMMED FROM THEIR MISCONCEPTION THAT THE TECHNOLOGICAL TREND WOULD CONTINUE TO FAVOR BOMBERS OVER FIGHTERS. IN THE EARLY 1930S, BOMBERS WERE TECHNOLOGICALLY SUPERIOR TO FIGHTERS. ONCE FIGHTER AIRCRAFT RECEIVED THE SAME TECHNOLOGY, THE FIGHTERS ONCE AGAIN RECOVERED THEIR SPEED ADVANTAGE AND HENCE TACTICAL MANEUVERABILITY OVER THE BOMBER. UNFORTUNATELY, THE TECHNOLOGICAL GAP BETWEEN FIGHTERS AND BOMBERS OCCURRED AT A CRITICAL TIME WHEN THE DOCTRINE FOR BOMBARDMENT AND PURSUIT WAS COALESCING. BY THE TIME FIGHTERS RECOVERED THEIR SPEED ADVANTAGE OVER BOMBARDMENT, THEY HAD ALREADY LOST THE BOMBER-FIGHTER DEBATE AND BEEN RELEGATED TO A PURELY DEFENSIVE MISSION.

National Policy and Pursuit Aviation

THE SHIFT OF PURSUIT AVIATION FROM AN OFFENSIVE FORCE TO DEFENSIVE FORCE, HOWEVER, DID NOT STEM WHOLLY FROM THE CONFLICT WITH BOMBERS OR TECHNOLOGICAL CHANGES. INDEED, THE TRANSFORMATION OF PURSUIT INTO A DEFENSIVE FORCE FROM 1933 TO 1936 CLOSELY ALIGNED THE AIR CORPS WITH NATIONAL POLICY. GENERAL ARNOLD DESCRIBED THE US SENTIMENT IN 1933 IN HIS AUTOBIOGRAPHY, "WE WERE GOING THROUGH A PERIOD IN OUR COUNTRY WHEN WE COULD NOT DO ANYTHING THAT MIGHT MAKE US LOOK MILITARISTIC. EVEN TOY CANNON OR SOLDIERS WERE FROWNED UPON."²⁴ THE FEELING PERVADED ALL LEVELS, INCLUDING NATIONAL POLICY. THE BAKER BOARD, SET UP BY THE WAR DEPARTMENT TO EXAMINE THE AIR CORPS AFTER ITS AIRMAIL FIASCO IN 1934, CLEARLY SUMMED UP THE NATIONAL SECURITY POLICY OF THE UNITED STATES. THE BOARD REPORTED, "OUR NATIONAL DEFENSE POLICY CONTEMPLATES AGGRESSIVE ACTION AGAINST NO NATION; IT IS BASED ENTIRELY UPON THE DEFENSE OF OUR HOMELAND AND OVERSEAS POSSESSIONS, INCLUDING PROTECTION OF OUR SEA- AND AIR-BORNE COMMERCE."²⁵

THE DEFENSIVE MINDSET OF THE NATION WAS NOT NEW; IT HAD BEEN IN PLACE SINCE THE TWENTIES. THE PROBLEM WITHIN THE AIR CORPS AND WAR DEPARTMENT IN GENERAL WAS THAT THE NATIONAL POLICY ON DEFENSE OF US SHORES DID NOT ALIGN WITH TRAINING MANUALS, REGULATIONS, OR DOCTRINE THAT IMPLIED A MASSIVE GROUND BATTLE SIMILAR TO WORLD WAR I.²⁶ THIS DILEMMA WAS ESPECIALLY ACUTE WITHIN THE AIR CORPS, WHICH REGARDED ITSELF AS AN INHERENTLY OFFENSIVE FORCE. THE 1935 WAR DEPARTMENT TRAINING REGULATION 440-15, *EMPLOYMENT OF THE AIR FORCES OF THE ARMY*, ILLUMINATED AIRPOWER'S CONFLICT WITH PUBLIC POLICY. IT NOTED, "ALL AIR OPERATIONS ARE OFFENSIVE. THIS IS TRUE EVEN WHEN AIR FORCES ARE ASSIGNED A DEFENSIVE MISSION, SINCE THEY CAN CARRY IT OUT BY ATTACK ONLY." IT CONTINUED TO DESCRIBE AIR OPERATIONS OF THE AIR FORCE AS ENTAILING OFFENSIVE AIR ATTACKS AGAINST ENEMY AIR FORCES, SURFACE COMBATANTS, FACTORIES, FUEL FACILITIES, POWER PLANTS AND UTILITIES.²⁷ THE WAR DEPARTMENT RECONCILED THE OFFENSIVE NATURE OF AIRPOWER WITH CURRENT UNITED STATES POLICY BY HIGHLIGHTING AIRPOWER'S OFFENSIVE CAPABILITIES IN A DEFENSIVE MISSION. SPECIFICALLY, BRIG GEN C. E. KILBOURNE, ASSISTANT CHIEF OF STAFF, WAR PLANS DEPARTMENT, NOTED,

THE PRINCIPLE MISSION FOR THE GHQ AIR FORCE IS DIVIDED INTO TWO PHASES:
FIRST: TO PREVENT THE ESTABLISHMENT OF AIR BASES BY A FOREIGN POWER, FROM WHICH AIR OPERATIONS CAN BE CONDUCTED THAT WOULD THREATEN THE SECURITY OF THE UNITED STATES, SECOND: TO DEFEAT ENEMY AIR FORCES THAT OCCUPY BASES WITHIN STRIKING DISTANCE OF UNITED STATES TERRITORY.²⁸

THE DILEMMA POSED BY USING INHERENTLY OFFENSIVE AIRPOWER FOR A DEFENSIVE NATIONAL POLICY CAUSED PURSUIT AVIATION TO TRAIN FOR BOTH OFFENSIVE AND DEFENSIVE MISSIONS. HOWEVER, AS FIGHTERS LOST THEIR OFFENSIVE MISSIONS OF ESCORTING BOMBERS AND PROVIDING AIR SUPERIORITY OVER ENEMY TERRITORY, PURSUIT AVIATION NATURALLY GRAVITATED MORE TOWARD THE

²⁴ H. H. Arnold, *Global Mission* (1949, reprint, Blue Ridge Summit, Pa.: Tab Books Inc., 1989), 141.

²⁵ *Final Report of War Department Special Committee on Army Air Corps* (Washington, D.C.: Government Printing Office, 1934), 62.

²⁶ Greer, 30-31.

²⁷ War Department Training Regulation (TR) 440-15, *Air Corps: Employment of the Air Forces of the Army*, 26 15 October 1935, 3-5. AFHRA 170.108.

²⁸ Brig Gen C. E. Kilbourne, memorandum, subject: Doctrines of the Army Air Corps, 21 December 1934, V-1, AFHRA 248.211-15.

DEFENSIVE MISSION. IN THE DEFENSE OF THE NATION, PURSUIT AVIATION FOUND A VITAL NICHE WHERE IT REMAINED A CRITICAL PART OF NATIONAL SECURITY. PURSUIT FARED WELL IN THAT NARROWLY DEFINED NICHE, BUT BECAME WOEFULLY UNPREPARED FOR THE BROADER TASKS WORLD WAR II WOULD DEMAND.

ONE OF THE DRAWBACKS OF THE DEFENSIVE MINDSET WAS THAT IT RESTRICTED PURSUIT DEVELOPMENT. FOR STARTERS, IT FURTHER SEPARATED PURSUIT AIRCRAFT FROM THE ROLE OF LONG-RANGE ESCORT FOR BOMBERS. CHENNAULT NOTES, "WITH REGARD TO THE SECOND FUNCTION OF PURSUIT AVIATION—THE SUPPORT OF ALL CLASSES OF FRIENDLY AVIATION WITHIN THE RADIUS OF ACTION OF PURSUIT—IT IS BELIEVED THAT LONG DISTANCE SUPPORT BY PURSUIT IS NOT PRACTICAL, ESPECIALLY WHERE AN AIR FORCE MUST BE DEVELOPED IN ACCORDANCE WITH A NATIONAL POLICY OF DEFENSIVE WARFARE ONLY."²⁹ CHENNAULT, ACTS'S BIGGEST PURSUIT PROPONENT, NOTED A SIMPLE YET, PERPLEXING PROBLEM. WHILE HEAVY BOMBERS COULD BE BUILT UNDER THE AUSPICES OF COASTAL DEFENSE, LONG-RANGE FIGHTERS TO ESCORT THEM COULD NOT BE BUILT USING THE SAME LOGIC, AS THEIR SOLE MISSION WOULD BE OFFENSIVE.³⁰ THUS, THE FOCUS ON DEFENSE BY PURSUITERS FURTHER DIMINISHED ANY MOTIVATIONS FOR A LONG-RANGE FIGHTER. INSTEAD, PURSUIT PILOTS PUSHED FOR FAST, LIGHTWEIGHT FIGHTERS, WHICH COULD CLIMB QUICKLY, TO INTERCEPT HOSTILE BOMBERS.³¹ CONSEQUENTLY, EVEN IF THE TECHNOLOGY WAS AVAILABLE IN THE EARLY THIRTIES FOR A LONG-RANGE FIGHTER, NEITHER THE FIGHTER PILOTS NOR THE BOMBER PILOTS PUSHED FOR IT. FOR PURSUIT PILOTS SUCH AN AIRCRAFT WAS OUTSIDE THE CONCEPT OF THEIR MISSION, WHILE BOMBER ADVOCATES DEEMED THE LONG-RANGE FIGHTER UNNECESSARY.

BY PREPARING FOR A SOLELY DEFENSIVE ROLE, PURSUIT AVIATORS RESTRICTED THEMSELVES TO A MISSION AREA THAT OVER TIME DEGRADED THE BREADTH OF PURSUIT AIRCRAFT CAPABILITY. IN 1935, THE GHQ AIR FORCE ELIMINATED BOMBS FROM PURSUIT AIRCRAFT.³² THE ELIMINATION OF THE BOMBS STEMMED FROM TWO SOURCES. FIRST, AIR CORPS LEADERS FELT MAKING ACCOMMODATIONS FOR BOMBS WOULD UNNECESSARILY DEGRADE THE PERFORMANCE OF PURSUIT AIRCRAFT. ADDITIONALLY, PURSUIT AVIATION'S DEFENSIVE MISSION DID NOT REQUIRE BOMBS. HENCE, THE GHQ AIR FORCE REMOVED PURSUIT BOMBING CAPABILITY BECAUSE IT WAS SUPERFLUOUS AND WASTEFUL. THE ACTION, HOWEVER, ELIMINATED A POTENTIALLY USEFUL SUPPLEMENT TO ATTACK AVIATION, A SECONDARY ROLE EXERCISED BY PURSUIT AIRCRAFT SINCE WORLD WAR I. THE 1937 AND 1939 ACTS PURSUIT TEXTS REFLECTED THE MINDSET CHANGE. NEITHER MANUAL LISTED GROUND ATTACK AS A SECONDARY MISSION OF PURSUIT; MARKING A BREAK FROM PREVIOUS THINKING THAT PURSUIT WAS USEFUL FOR ATTACK PURPOSES WHEN NOT ENGAGED IN AIR SUPERIORITY OPERATIONS.³³ MOST LIKELY, THE PURSUIT TEXT REMOVED ATTACK TO FALL IN LINE WITH GHQ AIR FORCE'S ATTITUDE THAT PURSUIT WOULD BE UNLIKELY TO ENGAGE IN ATTACK.

Maneuvers, Exercises, and Lessons

EXERCISES WITHIN THE AIR CORPS REFLECTED THE EVOLUTION OF AIR CORPS DOCTRINE AND HIGHLIGHTED THE COMPETITION BETWEEN PURSUIT AND BOMBARDMENT AVIATION. MANEUVERS FROM 1927 TO 1931 STRESSED COMBINED FORCE EMPLOYMENT CONSISTENT WITH WORLD WAR I EXPERIENCES. THE LATER MANEUVERS, IN 1933 AND 1934, REFLECTED A SHIFT TOWARDS PURSUIT DEFENSE VERSUS STRATEGIC BOMBING, MIRRORING THE DEBATE BETWEEN FIGHTERS AND BOMBERS.

DURING THE EARLY EXERCISES, PURSUIT AND BOMBERS FLEW TOGETHER EXECUTING MISSIONS IN SUPPORT OF GROUND FORCES. THE 1927 AND 1929 MANEUVERS BOTH PITTED A COMBINED AIR FORCE IN SUPPORT OF GROUND FORCES. THE 1927 MANEUVERS IN TEXAS MATCHED A COMBINED AIR

²⁹ Capt Claire L. Chennault, memorandum, subject: Comments on "A Suggestion for Study and Development," 4 December 1934, AFHRA 248.282-11.

³⁰ This may have been Chennault's rationalization given the inability of pursuit to provide long-range escort, as well as a poke at the bombardment proponents noting how they were not developing aircraft wholly inline with national policy.

³¹ Air Corps Tactical School, *Pursuit Aviation*, (Maxwell Field, Ala.: Air Corps Tactical School, September 1933), 12. AFHRA 248.101-8.

³² McCormick, 17.

³³ Air Corps Tactical School, *Pursuit Aviation*, (Maxwell Field, Ala.: Air Corps Tactical School, October 1937), AFHRA 248.101-8 and Air Corps Tactical School, *Pursuit Aviation*, (Maxwell Field, Ala.: Air Corps Tactical School, September 1939), AFHRA 248.101-8.

FORCE WITH THE ARMY'S 2ND DIVISION AGAINST A SIMULATED FOE. THE AIR CORPS ROLE WAS "TO SUPPORT THE OPERATIONS OF THE FIRST ARMY." AS SUCH, THE ARMY COMMANDER EXERCISED CLOSE CONTROL OVER AVIATION ASSETS, BUT ALLOWED THE AIR COMPONENT COMMANDER TO CHOOSE HIS MEANS AND METHODS. CONSPICUOUSLY, THE ARMY, RATHER THAN THE GHQ AIR FORCE CONTROLLED AIR CORPS BOMBERS DIRECTING THEM AGAINST ENEMY POSITIONS, TROOPS, AERODROMES, BRIDGES, AND LINES OF COMMUNICATION RATHER THAN STRATEGIC TARGETS.³⁴ DURING THE EXERCISE, PURSUIT FLEW DEFENSIVE PATROLS FOR GROUND TROOPS, INTERCEPT, ESCORT, AND GROUND ATTACK MISSIONS. FRIENDLY PURSUIT GAINED CONTROL OF THE AIR BY DEFEATING ALL ENEMY PURSUIT. SIGNIFICANTLY, BRIG GEN JAMES FECHET, COMMANDER ARMY AIR CORPS, NOTED, THAT UNLESS PURSUIT GAINED CONTROL OF THE AIR OR PROVIDED DIRECT SUPPORT TO BOMBERS, BOMBARDMENT MISSIONS IN DAYLIGHT OPERATIONS WOULD BE UNUSUAL.³⁵ HENCE, PURSUIT ESCORTED ALL BOMBARDMENT MISSIONS THAT FACED A HOSTILE THREAT.³⁶

UNLIKE THE 1927 MANEUVERS, THE 1929 OHIO MANEUVERS FEATURED A TWO-SIDED WAR, ALSO IN CONJUNCTION WITH GROUND UNITS. THE GROUND FORCES TOOK THE FORM OF A V CORPS STAFF EXERCISE, WHICH USED COLORED CANVAS PANELS TO MARK TROOP LOCATIONS AND MOVEMENTS (WHEN ATTACHED TO VEHICLES). NOTABLY, THE AIR CORPS EMPLOYED ATTACK, BOMBARDMENT, AND PURSUIT AIRCRAFT ON BOTH THE BLUE AND THE RED SIDES OF THE EXERCISE. OVER 200 PLANES PARTICIPATED IN THE OHIO EXERCISE. THE BLUE SIDE HAD A LIMITED NUMBER OF PURSUIT AIRCRAFT AND FLEW THEM ALMOST EXCLUSIVELY ON ESCORT MISSIONS FOR ATTACK AND BOMBARDMENT.³⁷ THE RED SIDE, WITH SIGNIFICANTLY MORE PURSUIT, EMPLOYED PURSUIT PRIMARILY FOR DEFENSE AND GROUND ATTACK. RED FORCES NEVER ESCORTED THEIR BOMBERS BECAUSE BLUE CHOSE NOT TO FLY DEFENSIVE PATROLS.³⁸

SEVERAL LESSONS EMERGED FROM THE 1929 MANEUVERS FOR PURSUIT. FIRST, PURSUIT'S STANDARD THREE-SHIP FORMATION WAS INEFFECTIVE, WINGMAN FLYING IN FORMATION OFF LEAD COULD NOT DELIVER ACCURATE AIMED FIRE. MAJ W. H. FRANK, THE EXERCISE'S HEAD UMPIRE, RECOMMENDED A REVIEW OF PURSUIT TACTICS TO ENABLE A LARGER PORTION OF THE FORCE TO DELIVER ACCURATE FIRE. ADDITIONALLY, SINGLE-SEAT PURSUIT WAS FOUND WANTING AS ESCORT FOR DEEP PENETRATION MISSIONS. ITS RANGE WAS TOO SHORT AND IT DID NOT HAVE THE ABILITY TO EXTRICATE ITSELF FROM A FIGHT AT A TIME OF ITS CHOOSING BECAUSE IT LACKED THE ABILITY TO DEFEND ITS TAIL. THE EXERCISE'S CRITIQUE THEREFORE RECOMMENDED DEVELOPING A TWO-SEAT OR MULTI-SEAT PURSUIT TO OVERCOME THIS PROBLEM. THE EXERCISE ALSO DEMONSTRATED THAT DEDICATED ATTACK AIRCRAFT WERE FAR SUPERIOR TO PURSUIT PLANES IN GROUND ATTACK. IT THUS CAUTIONED AGAINST USING PURSUIT IN GROUND ATTACK AND RECOMMENDED MAINTAINING DEDICATED ATTACK AIRCRAFT. FINALLY, THE EXERCISE HIGHLIGHTED THE INCREDIBLE SYNERGY GAINED BY OPERATING BOMBERS, ATTACK, AND PURSUIT TOGETHER AS AN AIR FORCE AGAINST A SINGLE OBJECTIVE. FRANK NOTED, "THERE IS CONSIDERABLE DOUBT AMONG THE UMPIRES AS TO THE ABILITY OF ANY AIR ORGANIZATION TO STOP A WELL ORGANIZED, WELL FLOWN AIR FORCE ATTACK."³⁹

THE 1930 MANEUVERS CONCENTRATED THE AIR FORCES AT MATHER FIELD IN CALIFORNIA. THE EXERCISE HIGHLIGHTED THE VALUE OF RADIO COMMUNICATIONS IN CONTROLLING INTERCEPT OPERATIONS AND TESTED THE EFFICACY OF PURSUIT BOTH IN CONJUNCTION WITH AND AGAINST BOMBARDMENT. THE EXERCISE DEMONSTRATED THAT HOSTILE PURSUIT WAS HIGHLY EFFECTIVE AGAINST UNESCORTED BOMBING AND THE FINAL REPORT CONCLUDED THAT "A DAYLIGHT PENETRATION

³⁴ Maurer, 239-241 and Brig Gen James E. Fechet, Commander Army Air Corps, "Air-Ground Maneuvers San Antonio, Texas May 15 – May 21, 1927," appendix IV, 7-10. AFHRA 248.2122.

³⁵ Fechet, appendix IV, 10 and appendix II, 9.

³⁶ The Air Corps simulated an enemy threat of pursuit, attack, and bombardment for the exercise. By the end, judges ruled friendly pursuit had destroyed or dispersed all hostile pursuit allowing the friendly bombers to conduct daylight unescorted raids.

³⁷ Blue forces consisted of 15 pursuit, 18 bombardment, 34 attack, and 15 observation aircraft. Red forces consisted of 50 pursuit, 6 bombardment, and 18 observation aircraft. Because red lacked attack aircraft, red pursuit flew ground attack missions as well as more conventional air-to-air missions.

³⁸ Maurer, 242 and Lt Col Ira Longanecker, trans., "The air-ground maneuvers of the Air Corps of The US Army, Fifth Corps area, Columbus, O., May 21-26, 1929," 5 May 1931, 24-30. AFHRA 248.2122.

³⁹ Maj W. H. Frank, "Critique Air-Ground Maneuvers Fifth Corps Area, May 1929," address at Wright Field, Ohio, 26 May 1929, 4-7, quote on 5, AFHRA 248.2122.

OF ANY CONSIDERABLE DEPTH BY BOMBARDMENT WITH ENEMY AVIATION ACTIVE [REQUIRED] PURSUIT SUPPORT.”⁴⁰ THE EXERCISE, FURTHER FOUND THAT TWO-SEAT ATTACK AIRCRAFT PROVIDED ADEQUATE BOMBER ESCORTS. THE REPORT ALSO NOTED THE VALUE OF TWO-SEAT PURSUIT AIRCRAFT BECAUSE THEY HAD A LONGER RANGE MORE SUITABLE FOR ESCORT AS WELL AS THE ABILITY TO KEEP HOSTILE PURSUIT FROM EXECUTING ATTACKS FROM THE DEEP 6 O’CLOCK POSITION OF THE BOMBERS. IT THEREFORE RECOMMENDED THE FURTHER DEVELOPMENT OF TWO-SEAT PURSUIT PLANES.⁴¹

AN ADDITIONAL EXERCISE IN JUNE OF 1930 TESTED THE ABILITY OF P-12BS TO OPERATE AS HIGH ALTITUDE ESCORTS AND SUPPRESS ANTI-AIRCRAFT ARTILLERY FIRE. THE 95TH PURSUIT SQUADRON FROM SELFRIDGE FIELD, MICHIGAN, ESCORTED SIX CURTISS B-2S TO LOS ANGELES AT 30,000 FEET. OVER, LOS ANGELES, THE FIGHTERS DOVE DOWN, SIMULATING ATTACKS ON ANTI-AIRCRAFT NESTS WITH MACHINE GUNS AND LIGHT BOMBS AS THE BOMBERS STRUCK THEIR TARGETS. BECAUSE THEY ONLY SIMULATED ATTACKS, THE AIRCREWS DID NOT RECEIVE ANY CONCRETE FEEDBACK. REGARDLESS, THE PURSUIT CREWS ASSESSED THAT THEY ENABLED THE BOMBERS TO HIT THE TARGET UNMOLESTED BECAUSE THEY SWEEPED THE SKIES FREE FROM ENEMY PURSUIT AND DISABLED THE ENEMY ANTI-AIRCRAFT NESTS “TO SUCH AN EXTENT THAT THEY WERE NOT ABLE TO DAMAGE THE ONCOMING BOMBERS.”⁴²

A YEAR LATER, IN 1931, THE 94TH PURSUIT SQUADRON DEMONSTRATED PURSUIT’S STRATEGIC MOBILITY. THE 94TH DEPLOYED TWELVE P-12S FROM SELFRIDGE FIELD, MICHIGAN TO WASHINGTON, D.C. THE P-12S CARRIED AUXILIARY FUEL TANKS THAT ALLOWED THEM TO FLY TO WASHINGTON WITHOUT STOPPING. ON LANDING, THEY DOWNLOADED THEIR AUXILIARY TANKS AND WERE READY, WITH ENOUGH GAS LEFT IN THEIR MAIN TANKS TO FLY A COMBAT SORTIE, LESS THAN TWO HOURS AFTER THEIR TAKEOFF FROM SELFRIDGE.⁴³ WHILE THE 94TH PURSUIT SQUADRON DEMONSTRATED THE POTENTIAL FOR AUXILIARY FUEL TANKS TO EXTEND THE RANGE OF PURSUIT AIRCRAFT, THERE IS NO EVIDENCE THAT ANYONE AT THE TIME CONSIDERED THE USE OF AUXILIARY TANKS FOR ESCORT MISSIONS.

THE AIR CORPS CANCELED THE 1932 MANEUVERS DUE TO MONEY SHORTAGES, BUT WHEN THEY STARTED AGAIN THE NEXT YEAR, THE FLAVOR OF THE EXERCISES HAD CHANGED. WHILE PREVIOUS MANEUVERS HAD PREDOMINANTLY EMPLOYED PURSUIT IN CONJUNCTION WITH BOMBARDMENT, IN THE TWO MANEUVERS IN 1933, BOTH PITTED PURSUIT AGAINST BOMBERS. THE LARGER, WEST COAST MANEUVERS AT MARCH FIELD EXAMINED A LARGE VARIETY OF CAPABILITIES IN A TEST OF STRATEGIC BOMBING VERSUS PURSUIT DEFENSE. THE EXERCISE INCORPORATED 261 AIRCRAFT, INCLUDING 106 P-12 PURSUIT, 73 B-6A AND B-4A BOMBARDMENT, AND 23 A-3B ATTACK AIRCRAFT.⁴⁴ THE MANEUVERS TESTED ALL ROLES AND MISSIONS OF THE AIR CORPS, BUT SPECIFICALLY TESTED PURSUIT AS BOTH DEFENDERS AND ESCORT.⁴⁵ IN MOST CASES, THE HIGH SPEEDS AND DEFENSIVE FIREPOWER OF THE BOMBERS PREVENTED PURSUIT AIRCRAFT FROM COMPLETING EFFECTIVE ATTACKS. BRIG GEN OSCAR WESTOVER, COMMANDING OFFICER G.H.Q. AIR FORCE (PROVISIONAL) FOR THE 1933 WEST COAST MANEUVERS, NOTED THE EFFECT THE SPEED DIFFERENTIAL HAD ON THE EXERCISE.

SINCE NEW BOMBARDMENT AIRCRAFT POSSESSES SPEED ABOVE TWO HUNDRED MILES PER HOUR, ANY INTERCEPTING OR SUPPORTING AIRCRAFT MUST POSSESS GREATER SPEED CHARACTERISTICS IF THEY ARE TO PERFORM THEIR MISSIONS. IN THE CASE OF PURSUIT AVIATION, THIS INCREASE OF SPEED MUST BE SO GREAT AS TO MAKE IT DOUBTFUL WHETHER PURSUIT AIRCRAFT CAN BE EFFICIENTLY OR SAFELY OPERATED EITHER INDIVIDUALLY OR IN MASS.⁴⁶

HE CONTINUED, NOTING, “BOMBARDMENT AVIATION HAS DEFENSIVE FIRE POWER OF SUCH QUANTITY AND EFFECTIVENESS AS TO WARRANT THE BELIEF THAT WITH ITS MODERN SPEEDS IT MAY BE CAPABLE OF

⁴⁰ Brig Gen W. E. Gilmore, “Report of Air Corps Field Exercises and Demonstrations 1930,” 22 July 1930, 8, AFHRA 248.2122-1.

⁴¹ Maj Willis H. Hale, “S-3 Report of Air Corps Field Exercises and Demonstrations 1930,” 22 July 1930, 15-16, AFHRA 248.2122-1 and Maurer, 245.

⁴² “Mimic Warfare at Los Angeles,” *Air Corps News Letter* XIV, no. 7 (9 June 1930): 153.

⁴³ Maurer, 231.

⁴⁴ GHQ Air Force (Provisional), *G-4 Report of the GHQ Air Force (Provisional)*, 1933, F-54, AFHRA 248.2122-3.

⁴⁵ Brig Gen O. Westover, *Report of the Commanding General of the GHQ Air Force (Provisional)*, 1933, 1-3, AFHRA 248.2122-3.

⁴⁶ *Ibid.*, 12.

EFFECTIVELY ACCOMPLISHING IT ASSIGNED MISSION."⁴⁷ THE KEY, NOTED BY WESTOVER, WAS THE COMBINATION OF SPEED AND FIREPOWER. HIGH BOMBARDMENT AIRCRAFT SPEEDS FORCED ATTACKING PURSUIT TO REMAIN WITHIN RANGE OF THE BOMBERS GUNS FOR A GREATER PERIOD IN ORDER TO EXECUTE A SHOT FROM THE STERN. LIKewise, HIGH CLOSURE SPEEDS MADE FLANKING OR HIGH ANGLE SHOTS IMPRACTICAL.

THE OTHER EXERCISE IN 1933 WAS THE FORT KNOX MANEUVERS. WHILE SIMILAR TO THE WEST COAST MANEUVERS, CHENNAULT SPECIFICALLY DESIGNED THE EXERCISE TO PIT A COMBINED DEFENSIVE FIGHTER/ANTI-AIRCRAFT ARTILLERY NETWORK AGAINST THE PENETRATING BOMBERS.⁴⁸ THE FOCUS OF THE EXERCISE FOR THE DEFENDERS WAS OPERATING THE WARNING NETWORK IN CONJUNCTION WITH THE PURSUITERS AND ARTILLERY TO INTERCEPT AND DESTROY THE BOMBERS. WHILE THE NET WAS IMPERFECT, THE PURSUIT AIRCRAFT PERFORMED EXCEEDINGLY WELL, VERIFYING THEIR ABILITY TO INTERCEPT BOMBER FORMATIONS WITH SUPPORT FROM THE GROUND NETWORK.⁴⁹ THE SUCCESS OF THE DEFENSIVE ARRAY LED THE EXERCISE DIRECTOR, MAJ GEN GEORGE VAN HORN MOSLEY TO AVOW, "EXCEPT UNDER SPECIAL CIRCUMSTANCES (SUCH AS METEOROLOGICAL CONDITIONS) A DAYLIGHT BOMBARDMENT OF AN OBJECTIVE DEFENDED BY AIRCRAFT, ANTI-AIRCRAFT AND AN INTELLIGENCE NET, WILL VERY LIKELY RESULT IN HEAVY LOSSES TO THE ATTACKING FORCE."⁵⁰ THE AIR DEFENSE COMMANDER ADDED, "THAT BOMBARDMENT AVIATION CANNOT SUCCESSFULLY CONDUCT UNINTERRUPTED DAY OPERATIONS WITHOUT PURSUIT SUPPORT AGAINST AN OBJECTIVE DEFENDED BY PURSUIT SUPPORTED BY A GROUND INTELLIGENCE NET AND OBSERVATION AVIATION."⁵¹ TO PURSUITERS, THE RESULTS WERE CLEAR—BOMBARDMENT NEEDED ESCORT. HOWEVER, THE AIR CORPS DID NOT UNIFORMLY ACCEPT THE RESULTS. CHENNAULT LATER CONTENDED THAT THE LESSONS FROM FORT KNOX WERE "CALMLY IGNORED BY THE BOMBER BOYS WHO CONTROLLED THE DEVELOPMENT OF THE AIR CORPS AT THAT TIME AND WHO WERE HELL-BENT FOR THE DOUHET AIR FORCE OF BOMBERS ONLY."⁵² CHENNAULT WAS NOT ENTIRELY CORRECT, AS LT COL ARNOLD SOUGHT TO REPLICATE CHENNAULT'S RESULTS THE FOLLOWING YEAR AT MARCH FIELD.

IN THE 1934 EXERCISES AT MARCH FIELD, LT COL ARNOLD REPEATED MANY OF THE SAME TESTS OF THE FORT KNOX EXERCISE WITH THE LATEST AIRCRAFT, THE P-26 AND B-12. HIS RESULTS RAN SOMEWHAT COUNTER TO FORT KNOX'S RESULTS. HE FOUND THAT THE AIR WARNING NET REQUIRED 115 MILES TO GIVE SUFFICIENT WARNING FOR PURSUIT TO INTERCEPT INBOUND BOMBERS AND FOIL THEIR ATTACK.⁵³ HE FOUND THE DISTANCE EXCESSIVE CONCLUDING THAT FRONTLINE AERODROMES LESS THAN 115 MILES FROM THE FRONT RISKED UNOPPOSED BOMBER ATTACK, BECAUSE NO WARNING NET COULD BE ESTABLISHED TO ADEQUATELY INTERCEPT THE INCOMING ATTACK. HE THUS SPECULATED, "PURSUIT OR FIGHTER AIRPLANES OPERATING FROM FRONT LINE AIRDROMES WILL RARELY INTERCEPT MODERN BOMBERS EXCEPT ACCIDENTALLY. SUCH BEING THE CASE, THEY CAN NORMALLY OPERATE SOLELY AGAINST OTHER PURSUITS OR OBSERVATION AND IT IS DOUBTFUL WHETHER SUCH OPERATIONS JUSTIFY THEIR EXISTENCE."⁵⁴

CHENNAULT REFUTED BOTH ARNOLD'S NUMBERS AND HIS COMMENTS. ARNOLD BASED HIS 115-MILE NUMBER ON IT TAKING PURSUIT AIRCRAFT 23 MINUTES FROM RECEIVING WARNING TO BEING AIRBORNE AND IN POSITION TO INTERCEPT THE BOMBERS. CHENNAULT ARGUED THAT FAULTY TECHNIQUE AND UNREALISTIC REQUIREMENTS ADDED 10-12 MINUTES OVER THE ACTUAL TIME REQUIRED

⁴⁷ Ibid., 12.

⁴⁸ Fort Knox exercises pitted 18 P-6Es and 18 P-12Es against 25 B-2s, B-7s, and B-9s; 9 P-16s (in an attack role); and 9 A-8s. Capt C. L. Chennault, *The Role of Defensive Pursuit*, 1933, 32, AFHRA 248.282-4.

⁴⁹ Chennault, *The Role of Defensive Pursuit*, 33-35.

⁵⁰ Maj Gen George Van Horn Mosley, memorandum to Commanding General, 5th Corps Area, subject: Report by the Director of Joint Antiaircraft – Air Corps Exercise, 29 June 1933, 2, AFHRA 248.2124-13.

⁵¹ Maj George H. Brett, memorandum to Commanding General, 5th Corps Area, subject: Final Report of Defense Commander (Air Corps): Joint Antiaircraft – Air Corps Exercise, 29 June 1933, 14, AFHRA 248.2124-13.

⁵² Chennault, *Way of a Fighter*, 23.

⁵³ Chennault determined from his experiences in the Fort Knox exercises that 56 miles was the required distance for pursuit aviation to get first warning of a pending attack. Chennault, *The Role of Defensive Pursuit*, 17.

⁵⁴ Lt Col H. H. Arnold, letter to the Chief of the Air Corps, subject: Employment of Tactical Units Equipped with Modern Pursuit and Bombardment Airplanes, 26 November 1934, 18, AFHRA 248.282-27.

FOR PURSUIT TO GET INTO ACTION. APPROPRIATE TECHNIQUES, THEREFORE, WOULD REDUCE THE REQUIRED 115-MILE WARNING DISTANCE ALMOST IN HALF. HE ALSO NOTED THAT PURSUIT MISSED MANY INTERCEPTS BECAUSE THE NETWORK PASSED INACCURATE DATA TO THE PURSUIT AIRCRAFT. CHENNAULT DID CONCEDE THE VULNERABILITY OF FRONT LINE AIR FIELDS TO ENEMY ATTACKS, ALBEIT THOSE MUCH CLOSER THAN 115 MILES, BUT ARGUED FRONT LINE AIRFIELDS NEVERTHELESS WOULD BE NECESSARY TO SUPPORT GROUND FORCES.⁵⁵

BEYOND THE AIR WARNING NET, LT COL ARNOLD ALSO FOUND THE SPEED OF THE BOMBERS PROVED A DECISIVE FACTOR IN THE EXERCISES. HE FOUND INCREASED BOMBER SPEED REQUIRED PURSUIT AIRCRAFT TO EXECUTE CORRECT INTERCEPTS THE FIRST TIME, ELSE THEY TENDED TO MISS THE BOMBERS. HE NOTED, "IF PURSUIT FAILS TO INTERCEPT AND PERMITS BOMBARDMENT TO GET BETWEEN IT AND THE OBJECTIVE, IT IS PRACTICALLY IMPOSSIBLE FOR PURSUIT TO OVERTAKE BOMBARDMENT BEFORE THE ATTACK IS DELIVERED." HE ALSO FOUND THAT THE SMALL SPEED DIFFERENTIAL MADE CONVENTIONAL PURSUIT ATTACKS AGAINST BOMBERS UNSUITABLE BECAUSE THE PURSUIT FLIGHTS COULD NOT PRESS STERN ATTACKS WITHOUT EXPOSING INDIVIDUAL PURSUIT FLIGHTS TO CONCENTRATED AND WELL-AIMED DEFENSIVE FIRE.⁵⁶ FROM THESE OBSERVATIONS, ARNOLD ARGUED, "THE INDIVIDUAL AIR DOG-FIGHTERS ARE APPARENTLY AS DEAD AS THE GLADIATOR OR ARMORED KNIGHT. IT ALMOST SEEMS DOUBTFUL THAT SINGLE-SEATER PURSUIT UNITS WILL REMAIN IN THE PICTURE."⁵⁷ FROM HIS OBSERVATIONS, ARNOLD CONCLUDED THAT MODERN FIGHTERS SIMPLY COULD NOT CATCH MODERN BOMBERS, HOWEVER, IF THEY DID, THE CONCENTRATED RETURN FIRE FROM THE BOMBER WOULD MOST SURELY NEGATE THEIR ATTACK. HENCE, FROM THE RESULTS OF BACK-TO-BACK WEST COAST EXERCISES, ARNOLD CONCLUDED THAT THE THEORY THAT UNESCORTED STRATEGIC BOMBING WAS SOUND AND WOULD SUCCEED.

THE FIGHTER ADVOCATES, HOWEVER, WERE NOT READY TO CONCEDE. IN HIS REBUTTAL TO ARNOLD'S CLAIM, CHENNAULT NOTED THAT THE P-26, ALTHOUGH ONLY TWO YEARS OLD, WAS ALREADY OBSOLETE COMPARED TO THE BOMBERS IN USE. CHENNAULT NOTED THAT WHILE THE B-12 WAS THE FOURTH IN A SERIES OF MONOPLANE BOMBERS INCLUDING THE B-7, B-9, AND B-10; THE P-26 WAS THE FIRST MONOPLANE DESIGNED AND PRODUCED FOR PURSUIT.⁵⁸ OF NOTE, THE P-26 SPORTED FIXED GEAR AND AN OPEN COCKPIT AS OPPOSED TO THE B-12'S CLOSED COCKPIT AND RETRACTABLE GEAR. CHENNAULT APTLY POINTED OUT THAT THE BOMBERS WERE MORE ADVANCED THAN THEIR COMPARABLE PURSUIT. CAPT HARLAN MCCORMICK, A 1937 TO 1938 ACTS STUDENT, ELABORATED UPON CHENNAULT'S CLAIM AND ARGUED THAT PURSUIT AIRCRAFT HAD STAGNATED, WHILE THE BOMBERS WERE ADVANCING. HE NOTED, "THIRTY-THREE MODELS OF PURSUIT PLANES WERE BUILT BY THE CURTISS PLANT BETWEEN 1923 AND 1933, AND, EXCEPT FOR THE POWER PLANT AND A FEW REFINEMENTS, THE LAST OF THE SERIES, THE P-6E, WAS PRACTICALLY THE PW-8 BUILT IN 1923."⁵⁹ THE SERIES MCCORMICK DESCRIBES WAS THE CURTISS HAWK SERIES, A FIXED GEAR BIPLANE. OVER THE TEN-YEAR SPAN, THE AIRCRAFT'S DESIGN CHANGED NEGLIGIBLY EXCEPT FOR THE INSTALLATION OF A LARGER MOTOR IN SUBSEQUENT MODELS. THE MOTOR ON THE HAWKS INCREASED FROM 435 TO 700 HORSEPOWER DURING THE 10 YEARS, INCREASING ITS SPEED FROM 168 TO 198 MPH.⁶⁰ THE CRITICAL FAULT OF PURSUIT AIRCRAFT, HOWEVER, WAS NOT THAT THEY HAD STAGNATED, BUT THAT THEY HAD FALLEN BEHIND THE DEVELOPMENT OF BOMBER AIRCRAFT. IF THE AIR CORPS BUILT A MODERN FIGHTER, WITH TECHNOLOGY SIMILAR TO THAT OF THE B-10 OR B-12 IT WOULD HAVE NEGATED THE SPEED ADVANTAGE OF THE BOMBERS AND RENDERED MOOT MANY OF ARNOLD'S ARGUMENTS AGAINST THE EFFICACY OF PURSUIT AGAINST BOMBERS.

WHILE ARNOLD DID NOT SEE THE NEED FOR ESCORT FROM THE 1934 EXERCISES, AT THE SAME TIME HE DID RECOGNIZE THAT ESCORT WOULD BE USEFUL, IF THE DESIGNER COULD BUILD ONE WITH SUFFICIENT RANGE TO TAKE THE BOMBERS TO THE OBJECTIVE AND BACK. DRAWING FROM HIS EXPERIENCES IN THE EXERCISE, ARNOLD NOTED THAT THE DESIRABLE ESCORT FIGHTER WOULD BE A LONG-RANGE, MULTI-PLACE AIRCRAFT. HE DISMISSED BOTH SINGLE-SEAT AND TWO-SEAT PURSUIT AS

⁵⁵ Capt Claire Chennault, memorandum to the Commandant, the Air Corps Tactical School, subject: Comments on Letter to Chief of the Air Corps, 7 March 1935, 4, 9, AFHRA 248.282-27.

⁵⁶ Arnold, letter to the Chief, 5, 7.

⁵⁷ Ibid., 14.

⁵⁸ Chennault, memo to the Commandant, 1.

⁵⁹ McCormick, 12.

⁶⁰ Ibid., 14.

UNVIALE. HE SAW THE TWO-SEAT PURSUIT AS NEARLY AS VULNERABLE AS THE BOMBERS BUT WITHOUT THE DEFENSIVE FIREPOWER. AS FOR SINGLE-SEAT PURSUIT, HE CONCLUDED, "SELDOM WILL SINGLE-SEAT PURSUIT BE USED IN CLOSE SUPPORT OF BOMBARDMENT. THE PRESENT TYPE PURSUIT PLANE DOES NOT HAVE SUFFICIENT FLYING RANGE TO ACCOMPANY BOMBARDMENT TO THE OBJECTIVE AND RETURN." HE THEREFORE PROPOSED, "THAT AN ENTIRELY NEW TYPE OF AIRCRAFT, THE MULTI-SEATER FIGHTER SHOULD BE DEVELOPED FOR EXPERIMENT AND TEST WITHOUT DELAY."⁶¹ THE MULTI-SEAT, ESCORT FIGHTER PROPOSED BY ARNOLD WOULD SHIELD THE BOMBERS FROM THE ENEMY FIGHTERS WITH AN OVERWHELMING NUMBER OF GUNS AND DEFENSIVE ARMOR; IT WOULD NOT TRY TO OUTMANEUVER HOSTILE PURSUIT.

CHENNAULT FOUGHT STRENUOUSLY AGAINST THE MULTI-SEAT FIGHTER. HE ARGUED THAT FOR AN ESCORT FIGHTER TO BE SUCCESSFUL, IT NEEDED TO DEFEAT HOSTILE PURSUIT. AS SUCH, THE ESCORT AIRCRAFT NEEDED TO HAVE PERFORMANCE EQUAL TO THE HOSTILE PURSUIT OR ELSE IT WOULD SIMPLY JOIN THE BOMBERS AS FODDER. CHENNAULT NOTED IN A REBUTTAL TO ARNOLD, "IT IS NOT CONCEIVABLE THAT A MULTI-SEATER CAN BE BUILT" TO OUT PERFORM A SINGLE-SEATER. IN ADDITION HE ARGUED, "THE SINGLE-SEATER WILL ALWAYS BE FAR LESS EXPENSIVE THAN THE MULTI-SEATER," ALLOWING IT TO BE FIELDED IN GREATER NUMBERS.⁶² THE EXPERIENCES OF WORLD WAR II PROVED CHENNAULT CORRECT. THE GERMAN-BUILT LONG-RANGE, MULTI-PLACE PENETRATION ESCORT FIGHTERS, THE ME-110 AND ME-210s, "WERE COLD MEAT TO [THE BRITISH] SPITFIRES AND HURRICANES." THE USAAF ALSO TRIED A MULTI-PLACE, HEAVILY ARMED ESCORT DERIVATIVE OF THE B-17 IN THE YB-40. IT "QUICKLY PROVED A COMPLETE FAILURE,"⁶³ VERIFYING CHENNAULT'S CONTENTION THAT ONLY A SINGLE-SEAT AIRPLANE COULD ADEQUATELY COMPETE AGAINST HOSTILE SINGLE-SEAT ENEMY PURSUIT.

UNFORTUNATELY, NEITHER CHENNAULT NOR ARNOLD ENVISIONED ANY OTHER SOLUTION TO THE PROBLEM OF LONG-RANGE ESCORT. NEITHER ACKNOWLEDGED THE POSSIBILITY OF USING EXTERNAL TANKS TO EXTEND THE RANGE OF PURSUIT AIRCRAFT. FOR INSTANCE, ARNOLD AND THE BOMBER PROPONENTS CONTINUED TO ARGUE FOR A LARGE ESCORT FIGHTER, WHILE CHENNAULT, ON THE OTHER HAND, PROPOSED AN EVEN LESS SATISFYING SOLUTION:

IT IS BELIEVED THAT LONG DISTANCE SUPPORT BY PURSUIT IS NOT PRACTICAL.... LONG RANGE BOMBARDMENT ATTACKS MUST ATTAIN THEIR OBJECTIVE BY ATTAINING SURPRISE, TAKING ADVANTAGE OF METEOROLOGICAL CONDITIONS, ATTACKING OBJECTIVES UNDEFENDED BY AIRCRAFT OR OBJECTIVES DEFENDED BY AIRCRAFT INCAPABLE OF OFFERING EFFECTIVE RESISTANCE, OR BY ROUTING SO AS TO AVOID THE POSSIBILITY OF CONTACT WITH DEFENDING AIRCRAFT.⁶⁴

WHILE THE TECHNOLOGY IN THE EARLY 1930S MAY NOT HAVE EXISTED TO BUILD A SINGLE-SEAT ESCORT FIGHTER WITH SUFFICIENT RANGE TO MATCH BOMBERS, NEITHER ARNOLD NOR CHENNAULT PUSHED TO EXPLORE THE POSSIBILITY. INSTEAD, BOMBARDMENT PROPONENTS PUSHED FOR AN ESCORT FIGHTER THAT PURSUIT PILOTS DID NOT SUPPORT, WHILE PURSUIT PILOTS OFFERED A SUGGESTION NO BETTER THAN TO KEEP THE BOMBERS AWAY FROM HOSTILE PURSUIT. NEITHER SIDE COULD OFFER A SATISFACTORY SOLUTION TO THE PROBLEM

THE LASTING EFFECT OF THE EXERCISES, ESPECIALLY THE ONES OCCURRING IN THE LATE 1930s, WAS THAT BOMBERS GAINED THE UPPER HAND IN THE BOMBER VERSUS PURSUIT CONFLICT. TECHNOLOGICAL SUPERIORITY ALLOWED BOMBERS TO APPEAR INVULNERABLE TO PURSUIT AVIATION AND THUS BOMBARDMENT PROPONENTS GAINED THE EDGE THEY NEEDED TO DECIDE THE DEBATE IN THEIR FAVOR. THE RESULTS OF EXERCISES, HOWEVER, WERE AMBIGUOUS, ALLOWING PURSUITERS AND BOMBARDIERS TO EACH DRAW SEPARATE AND CONTRADICTORY LESSONS FROM THE SAME EXERCISES, THUS CREATING A SCHISM BETWEEN BOMBARDMENT AND PURSUIT THOUGHT. THE SCHISM EXISTED BECAUSE FLAWS WITHIN THE EXERCISES PREVENTED AN ACCURATE ASSESSMENT OF FIGHTER VERSUS BOMBER CAPABILITIES.

⁶¹ Arnold, memorandum to the Chief, 17.

⁶² Chennault, memorandum to the Commandant, 7.

⁶³ Emerson, 450, 461.

⁶⁴ Chennault, memo on 'A Suggestion for Study and Development,' 4.

Exercise Shortfalls and Their Effects

THE GREATEST SHORTCOMING OF AIR CORPS EXERCISES CAME IN ASSESSING THE AERIAL FIGHTS. ASSESSING FIGHTS BETWEEN BOMBERS AND FIGHTERS PROVED DIFFICULT, BECAUSE ONE COULD NOT ACCURATELY MEASURE THE EFFECTS OF AIR-TO-AIR COMBAT. AIRMEN COULD ACCURATELY SCORE AERIAL BOMBARDMENT AND GUNNERY VERSUS A TOWED OR GROUND TARGET, BUT ACTUAL COMBAT EFFECTS OF AIR-TO-AIR GUNNERY HAD TO BE ESTIMATED. CAPTAIN MCCORMICK NOTES THE PROBLEM IN HIS 1938 ACTS THESIS.

THERE IS YET TO BE DEVELOPED A SUITABLE MEANS OF SIMULATING THE PURSUIT PILOT'S NATURAL TARGET, THUS GIVING HIM A MEANS TO LEARN HIS MOST ESSENTIAL JOB, AND DEMONSTRATE THE VALUE OR WORTHLESSNESS OF PURSUIT AVIATION AS A THREAT AGAINST HOSTILE AIRCRAFT. AT THE PRESENT TIME, ONLY REAL BULLETS OF WAR CAN PROVE ANYTHING. ON THE OTHER HAND, BOMBARDMENT AND ATTACK AVIATION CAN WELL DEMONSTRATE THEIR EFFECTIVENESS IN TIME OF PEACE AGAINST ALL THEIR NATURAL TARGETS, EXCEPT ATTACKING PURSUIT. THIS IN BRIEF, IS THE REAL REASON OF THAT NEVER-ENDING CONTROVERSY OF PURSUIT VS. BOMBARDMENT (EMPHASIS IN ORIGINAL).⁶⁵

BECAUSE OF THE INABILITY TO SCORE AIR-TO-AIR GUNNERY, THE AIR CORPS SETTLED FOR SUBJECTIVE METHODS TO SCORE RESULTS. IN THE 1929 OHIO EXERCISES, JUDGES BASED THEIR CONCLUSIONS ON THE NUMBER OF AIRCRAFT INVOLVED WITH NO QUALITATIVE ASSESSMENT OF AERIAL ATTACKS. JUDGES SCORED RESULTS AND CREDITED KILLS BASED SIMPLY ON THE NUMBER OF AIRCRAFT IN AN ENGAGEMENT. FOR INSTANCE, IF AN UNESCORTED BOMBARDMENT FORCE MET A HOSTILE PURSUIT FORCE OF TWO TIMES OR GREATER ITS SIZE, THE BOMBERS WOULD LOOSE ONE-THIRD OF THEIR FORCE, AND THE ATTACKING PURSUIT FORCE, ONE-HALF THAT NUMBER. OF PARTICULAR NOTE, JUDGES CONSIDERED ATTACK AIRCRAFT EQUAL TO PURSUIT FOR THEIR OWN SELF-DEFENSE. EXERCISE RULES DICTATED THAT ATTACK AIRCRAFT COULD SELF-DEFEND, NEGATING THE NEED FOR PURSUIT AIRCRAFT TO ESTABLISH AIR SUPERIORITY OVER THE FRONTLINES.⁶⁶

IN OTHER EXERCISES, SUCH AS AT FORT KNOX IN 1933; OFFICIALS DID NOT ATTEMPT TO VERIFY THE EFFECT OF PURSUIT AGAINST BOMBERS. THE EXERCISE SIMPLY ASSESSED THE ABILITY OF FIGHTERS "TO DETECT THE APPROACH OF MODERN BOMBARDMENT AIRPLANES TO A TARGET IN SUCH TIME AS TO PERMIT THE DELIVERY OF SOME FIRE UPON SOME OF THE AIRPLANES." AS SUCH, "THE PLAN DID NOT CONTEMPLATE THE ENGAGEMENT OF RIVAL FORCES IN A WAR MANEUVER AND NO ATTEMPT WAS MADE TO ASSESS LOSSES OR DAMAGES RESULTING FROM ANY OPERATION."⁶⁷ THIS TECHNIQUE RAISED INTO QUESTION THE VERACITY OF THE FORT KNOX CONCLUSIONS. TRUE, THE EXERCISE HAD PROVEN THE ABILITY OF PURSUIT TO INTERCEPT BOMBARDMENT, BUT IT HAD NOT DETERMINED WHETHER PURSUIT WOULD BE EFFECTIVE AGAINST THE BOMBERS' DEFENSES. THE 1933 EXERCISES AT MARCH FIELD SCARCELY DID BETTER IN SCORING. WESTOVER RESTRICTED PURSUIT INTERCEPTS TO AT CLOSEST 500 YARDS FROM THE BOMBERS FOR SAFETY REASONS, PREVENTING BOTH PURSUIT AND BOMBERS ALIKE FROM MAKING REALISTIC GUN ATTACKS WITHIN THE EFFECTIVE RANGE OF THEIR GUNS.⁶⁸ IN SHORT, NEITHER THE FORT KNOX NOR THE MARCH EXERCISES PROVIDED A FAIR ASSESSMENT OF THE EFFICACY OF PURSUIT BEYOND THE ABILITY TO LOCATE AND INTERCEPT THE BOMBERS. NEITHER EXERCISE ASSESSED AERIAL MARKSMANSHIP.

TO HELP ASSESS AERIAL GUNNERY TRAINING, THE 1ST PURSUIT GROUP DID RECEIVE GUN CAMERAS IN 1931.⁶⁹ THE CAMERAS ENABLED THE FIRST'S PILOTS TO SCORE AERIAL GUNNERY AGAINST A MANNED TARGET BY REVIEWING THEIR FILMS AFTER THE SORTIE FOR VALID SHOTS. EVEN SO, ASSESSMENT OF AERIAL MANEUVERS REMAINED INCOMPLETE AS GUN CAMERAS PROVED ONLY A PARTIAL SOLUTION BECAUSE LETHAL GUNSHOTS OFTEN OCCURRED WITH THE TARGET OUT OF VIEW OF THE

⁶⁵ McCormick, 16.

⁶⁶ Maurer, 241-243.

⁶⁷ Chennault, *The Role of Defensive Pursuit*, 24.

⁶⁸ GHQ Air Force (Provisional), *GHQ Air Force (Provisional) Command and Staff Exercises 354.1 Critique*, 15 May 1933, 30, AFHRA 248.2122-3.

⁶⁹ "Gun Camera for Pursuiters," *Air Corps News Letter* XV, no. 15 (28 December 1931): 468.

CAMERA DUE TO THE LEAD REQUIRED UNDER THE G-LOADS TYPICAL OF AERIAL COMBAT.⁷⁰ CAPT TOWNSEND GRIFFISS, AN AIR CORPS OBSERVER IN DURING THE SPANISH CIVIL WAR, SUMMED UP THE CAMERAS SHORTCOMINGS, "AERIAL GUNNERY IS THE MOST IMPORTANT PART OF A PILOT'S TRAINING AND IS ONE PART THAT IS SERIOUSLY NEGLECTED IN MOST AIR FORCES. CAMERA GUNS HAVE REPLACED BULLETS WITH THE RESULTING BUILDING UP OF A SENSE OF EFFICIENCY WHICH IN ACTUALITY DOES NOT EXIST."⁷¹ CAMERAS WERE ALSO AVAILABLE FOR THE FLEXIBLE GUNS OF BOMBERS, BUT THEY FACED THE SAME LIMITATIONS AS THOSE ON THE FIGHTERS.⁷²

INCOMPLETE ASSESSMENT OF THE KEY PURSUIT STRENGTHS LED BOMBER ADVOCATES TO OVERESTIMATE THE BOMBERS SURVIVABILITY. THE 1940 AIR CORPS BOARD ON PURSUIT AVIATION NOTED SOME OF THE FACTORS OVERLOOKED WHEN COMPARING THE RESULTS OF EXERCISES WITH ACTUAL EXPERIENCE.

SOME OF THE VITAL CONSIDERATIONS THAT APPEAR TO HAVE BEEN OVERLOOKED BY THE ADVOCATES OF BOMBARDMENT'S ABILITY TO DEFEND ITSELF SUCCESSFULLY AGAINST PURSUIT ATTACK ARE AS FOLLOWS:

- a. THE AMOUNT OF CONCENTRATED FIRE POWER A PURSUIT AIRPLANE CAN BRING TO BEAR AGAINST A BOMBARDMENT PLANE.
- b. THE GREATLY SUPERIOR ACCURACY OF FIRE OF THE FIXED GUN AS COMPARED WITH THE FLEXIBLE GUN.
- c. THE RELATIVE SIZE OF VULNERABLE PARTS OF THE RESPECTIVE TARGETS.
- d. THE PROTECTION AFFORDED THE PURSUIT PILOT BY THE ENGINE AS COMPARED WITH PRACTICALLY NO PROTECTION FOR THE BOMBARDMENT GUNNERS.
- e. THE DIFFICULTIES OF FLEXIBLE MACHINE GUN FIRING, SUCH AS ANGLE FIRING, LACK OF EFFECTIVE RECOIL MECHANISM, AND SUITABLE AIMING AND FIRE CONTROL DEVICES.⁷³

ANOTHER PROBLEM WITH THE EXERCISES WAS THE FAILURE TO TAKE INTO ACCOUNT THE REALITIES OF WAR. PURSUIT PILOTS RECOGNIZED THAT THEY DID NOT NEED TO STOP EVERY BOMBER EVERY TIME. IF THEY COULD NOT DESTROY THE ENEMY AIR FORCE, PURSUIT COULD "INFLECT SUCH CASUALTIES ON THE ENEMY THAT THE ATTRITION MAY LOWER THE ENEMY MORALE, THEREBY CAUSING HIM TO LOSE THE DESIRE AND WILL TO EVER REPEAT THE ATTACK."⁷⁴ THEIR SUCCESS DEPENDED ON INFLECTING SUCH LOSSES ON THE ENEMY OVER TIME THAT THE ENEMY WOULD BE UNWILLING OR UNABLE TO CONTINUE TO PROSECUTE THE WAR. MCCORMICK SUMMARIZED IN HIS THESIS,

PURSUIT PROBABLY CANNOT KEEP ALL OF A BOMBARDMENT UNIT FROM REACHING ITS OBJECTIVE, BUT CAN INFLECT SUCH SEVERE LOSSES THAT IT WILL CONTRIBUTE IN A LARGE MEASURE IN LIMITING THE ACTIVITY OF AN ENEMY... REGARDLESS OF THE WEALTH OF A NATION, IT TAKES TIME TO REPLACE LARGE PLANES, AND THE LOSS OF THEM BEFORE OR AFTER THEY REACH THEIR OBJECTIVE WOULD BE A SERIOUS BLOW TO ANY AIR FORCE (EMPHASIS IN ORIGINAL).⁷⁵

BECAUSE THE EXERCISES BASED RESULTS ON INDIVIDUAL SORTIES, THEY COULD NOT ACCURATELY MEASURE THE EFFECT OF ACCUMULATED LOSSES ON MORALE AND THE ENEMY'S WILL TO KEEP FIGHTING. THE EXERCISES ONLY QUESTIONED WHETHER PURSUIT WAS EFFECTIVE AGAINST THE BOMBERS TODAY, WHEN THEY REALLY NEEDED TO ASK IF ENOUGH BOMBERS SURVIVED THROUGHOUT THE EXERCISE TO ALLOW OPERATIONS TO CONTINUE BOTH FISCALLY AND MENTALLY. UNFORTUNATELY, THE LATER QUESTION WAS NEARLY IMPOSSIBLE TO ANSWER IN ANY EXERCISE.

⁷⁰ McCormick, 16.

⁷¹ Captain Townsend Griffiss, Air Corps observer, memorandum, subject: Spain (Aviation): Organizational Training, Tactics Employed, 25 April 1937, file, 248.282-23, AFHRA.

⁷² 1Lt James E. Briggs, memorandum to Commanding Officer 18th Pursuit Group, subject: Cooperative Gunnery Problem with the 50th Observation Squadron, 1 March 1937, 2, AFHRA 242.282.

⁷³ Report of the Air Corps Board, "Study No. 54: Pursuit Training and Pursuit Plane and Tactical Development" (Maxwell Field, Ala.: 27 August 1940), 3. AHRA 167.5-54.

⁷⁴ ACTS, *Pursuit Aviation*, October 1937, 25, AFHRA 248.101-8.

⁷⁵ McCormick, 16, 37.

Resulting Pursuit Doctrine

PURSUIT'S LOSS TO BOMBARDMENT DURING THE YEARS IS NOWHERE MORE APPARENT THAN IN AIR CORPS DOCTRINE AND THE INSTRUCTION AT THE AIR CORPS TACTICAL SCHOOL. THE 1935 TR 440-15, *EMPLOYMENT OF THE AIR FORCES OF THE ARMY*, BREAKS FROM THE 1926 VERSION BY REDUCING THE IMPORTANCE OF PURSUIT AVIATION. THE 1926 VERSION STATED THAT PURSUIT AVIATION WAS NECESSARY TO OBTAIN "THE FULL VALUE OF OBSERVATION, BOMBARDMENT, AND ATTACK AVIATION." THE 1935 REGULATION SOFTENED ITS LANGUAGE. PURSUIT AVIATION IS EMPLOYED "TO SUPPORT BOMBARDMENT, ATTACK, AND OBSERVATION AIRCRAFT, TO INTERDICT ENEMY BOMBARDMENT AND ATTACK AVIATION, AND TO DENY OPERATIONS TO HOSTILE AVIATION." ANOTHER TELLING OBSERVATION COMES BY COMPARING TR 440-15 TO ITS EARLIER VERSION IN THAT PURSUIT AVIATION MOVED FROM FIRST TO THIRD, AFTER BOMBARDMENT AND ATTACK, IN THE ORDER OF DISCUSSION OF AIR CORPS MISSIONS. FINALLY, THE ONLY MENTION OF AIR SUPERIORITY IN THE 1935 VERSION CONTAINS THE CAVEAT THAT SUCH A CONDITION IS UNLIKELY TO OCCUR. IT NOTES, "COMPLETE CONTROL OF THE AIR CAN BE GAINED AND MAINTAINED ONLY BY THE TOTAL DESTRUCTION OF THE ENEMY'S FORCES. SINCE THIS IS UNLIKELY EVER TO BE ACCOMPLISHED, HOSTILE AIR ATTACKS MUST BE RECKONED WITH AT ALL TIMES."⁷⁶ IN SHORT, TR 440-15 DISCOUNTED THE OFFENSIVE CAPABILITY TO ACHIEVE AIR SUPERIORITY AND RELEGATED PURSUIT AVIATION TO THE DEFENSIVE MISSIONS TO PROTECT FRIENDLY FORCES EITHER IN THE AIR OR ON THE GROUND.

WHILE EXAMINING TR 440-15 PROVIDES A GLIMPSE INTO OFFICIAL DOCTRINE, COMPARING THE INSTRUCTION AT ACTS OFFERS A CLEARER PICTURE INTO PURSUIT THINKING IN THE AIR CORPS. ACTS CLEARLY ACCEPTED AND ADVOCATED THE BOMBER AS THE PRIMARY AVIATION BRANCH. THE 1933-1934 *AIR FORCE* TEXT "STATED UNEQUIVOCALLY THAT EVEN IF THE OVER-ALL NATIONAL EFFORT BE DEFENSIVE, THE AIR FORCE AS A WHOLE HAD TO WAGE OFFENSIVE ACTION. AND SINCE DESTRUCTION BY AIRPOWER WAS WROUGHT CHIEFLY THROUGH BOMBING, BOMBARDMENT WAS THE PRINCIPAL ARM OF THE AIR FORCE."⁷⁷ WITHIN THE PURSUIT BRANCH, THE PRIMARY PROPONENT OF PURSUIT WAS CHENNAULT. HE DID NOT QUESTION THE IMPORTANCE OF BOMBARDMENT, BUT HE HAD A RICHER VISION FOR PURSUIT.⁷⁸ HE RECOGNIZED AIR SUPREMACY AS THE KEY TO AIRPOWER AND PURSUIT WAS THE MEANS TO GAIN IT.

CHENNAULT'S VISION IS CLEAR IN THE 1933 *PURSUIT AVIATION* TEXT, THE LAST HE WROTE BEFORE HIS DEPARTURE FROM ACTS IN 1936. CHENNAULT TRIED TO UPHOLD THE DOCTRINE OF PURSUIT DEVELOPED DURING THE FIRST WORLD WAR.⁷⁹ HE ARGUED, "SINCE THE WORLD WAR THERE HAS BEEN NO NEW AERONAUTICAL DEVELOPMENT OR INVENTION WHICH RENDER UNSOUND THE BROAD PRINCIPLES EVOLVED DURING THE WAR." HE SUMMARIZED THOSE PRINCIPLES ILLUMINATED BY WORLD WAR I:

1. THE ATTAINMENT OF AERIAL SUPREMACY... DEPENDED DIRECTLY UPON THE EFFORTS AND SUCCESS OF THE PURSUIT FORCE.
2. THE PRIMARY FUNCTION OF PURSUIT WAS TO ATTAIN AND MAINTAIN AERIAL SUPREMACY.
3. THE FIRST OBJECTIVE OF PURSUIT WAS THE DESTRUCTION OF THE EFFECTIVE HOSTILE PURSUIT FORCE.
4. SUCCESS OF PURSUIT... DEPENDED UPON EQUIPMENT, SELECTION AND SPECIALIZED TRAINING OF PILOTS, NUMBERS, TACTICS, AND ORGANIZATION. UNITS MUST BE SUFFICIENTLY LARGE ENOUGH TO PROVIDE EFFECTIVE CONCENTRATION OF FORCE.⁸⁰

HE STRESSED OFFENSIVE OPERATIONS AS THE PRIMARY ROLE OF PURSUIT AVIATION, BUT DID NOT DISCOUNT ESCORT AS A VIABLE MISSION OF PURSUIT. "THE NORMAL OFFENSIVE OPERATIONS OF PURSUIT SHOULD PROVIDE SUFFICIENT PROTECTION FOR OTHER AIR FORCES. HOWEVER, WHEN IT IS DESIRED THAT A COMBINED AIR FORCE OFFENSIVE BE CONDUCTED, PURSUIT WILL COOPERATE WITH

⁷⁶ TR 440-15, 15 October 1935, 2, 4 and TR 440-15, 26 January 1926, 8.

⁷⁷ Greer, 55.

⁷⁸ Byrd, *Chennault*, 50

⁷⁹ Greer, 61.

⁸⁰ ACTS, *Pursuit Aviation*, September 1933, 111-112, AFHRA 248.101-8.

BOMBARDMENT AND ATTACK AVIATION IN CARRYING A VIGOROUS OFFENSIVE INTO HOSTILE TERRITORY.”⁸¹ UNFORTUNATELY, CHENNAULT WAS ONE OF THE FEW PURSUIT ADVOCATES AT ACTS AND HE WAS LOSING THE DEBATE WITH THE BOMBER ADVOCATES.

BY 1934, THE BOMBER ADVOCATES HAD WON THE DEBATE AT ACTS. ACCORDING TO ROBERT FINNEY, ACTS HISTORIAN, “PURSUIT INSTRUCTION REACHED ITS ALL-TIME LOW DURING THE PERIOD FROM 1934 TO 1936.” AFTER CHENNAULT LEFT IN 1936, ACTS CONTINUED TO TEACH PURSUIT TACTICS, BUT ITS “CHIEF FUNCTION HAD BEEN ALTERED FROM THAT OF GAINING AIR SUPERIORITY TO ONE OF DEFENDING CIVILIAN AND MILITARY CENTERS AND AIRCRAFT IN FLIGHT-INTERCEPTION AND ESCORT. BECAUSE OF PURSUIT’S LIMITED RANGE, HOWEVER, ITS OPERATIONS [CONSISTED] ALMOST WHOLLY OF INTERCEPTION MISSIONS.”⁸² THE CHANGE IN FOCUS OF PURSUIT INSTRUCTION AT ACTS IS READILY APPARENT IN THE 1937 *PURSUIT AVIATION* TEXT. IT NOTES:

IT IS EVIDENT THAT THERE SHOULD BE CHANGES IN THE TACTICS AND TACTICAL EMPLOYMENT OF PURSUIT FROM THOSE USED DURING THE WORLD WAR. DUE TO PRESENT LACK OF RANGE, PURSUIT IS CONFINED IN ITS OPERATIONS TO COMPARATIVELY LIMITED RANGES. PRESENT ATTACKING AIRPLANES CAN OPERATE AT MUCH GREATER DISTANCES. THEREFORE, UNLESS SOME IMPROVEMENT IS MADE IN ITS RANGE, PURSUIT WILL BE USED ON DEFENSIVE MISSIONS.

THE TEXT CONTINUES, “THE PRINCIPAL OBJECTIVES OF OUR PURSUIT TODAY ARE THE HOSTILE LONG-RANGE AIRPLANES CARRYING LARGE LOADS OF DESTRUCTIVE BOMBS AND CHEMICALS AND HEAVILY EQUIPPED WITH DEFENSIVE ARMAMENT.”⁸³ NOWHERE DOES THE TEXT ADDRESS ENEMY PURSUIT AS THE PRIMARY TARGET OF AIR-TO-AIR COMBAT, BUT THE TEXT DOES CLAIM THAT US PURSUIT MUST BE PREPARED TO FIGHT ENEMY PURSUIT IF NECESSARY.

THE CHANGE IN FOCUS FROM 1933 TO 1937 IS CLEAR. PURSUIT AVIATION NO LONGER WAS AN OFFENSIVE FORCE MEANT TO GAIN AIR SUPERIORITY. AVIATORS HAD RELEGATED PURSUIT TO A DEFENSIVE ROLE, A MISSION THROUGH WHICH PURSUIT WOULD SURVIVE, AND IN SOME RESPECTS THRIVE, UNTIL EVENTS LEADING UP TO WORLD WAR II DICTATED A RETHINKING OF THE MISSION OF PURSUIT.

Results

ARGUABLY, THE ENTIRE BOMBER-FIGHTER DEBATE WAS ROOTED IN THE TECHNOLOGY GAP BETWEEN FIGHTERS AND BOMBERS IN THE EARLY 1930S. THE TECHNOLOGY GAP OCCURRED AT A CRITICAL JUNCTURE DURING THE DEVELOPMENT OF BOMBARDMENT THEORY, AND THEREFORE, IT SPAWNED TWO KEY CONCLUSIONS THAT PLAGUED BOMBARDMENT AVIATION INTO WORLD WAR II. THE FIRST WAS THAT THE HIGH SPEED OF THE BOMBERS, COUPLED WITH THEIR DEFENSIVE ARMAMENT, COULD NEGATE ANY PURSUIT ATTACK. THE SECOND CONCLUSION FLOWED NATURALLY FROM THE FIRST, BECAUSE PURSUIT WAS INEFFECTUAL, BOMBERS DID NOT REQUIRE AN ESCORT. THE FORMER RAISED INTO QUESTION THE EFFICACY OF PURSUIT AVIATION AND FUELED THE FIGHTER-BOMBER DEBATE WHILE THE LATTER FORCED PURSUIT INTO A DEFENSIVE ROLE.

A RESULT OF THE BOMBER-FIGHTER DEBATE WAS A LOPSIDED DISTRIBUTION OF MONEY AND ATTENTION TOWARDS BOMBARDMENT. AS HISTORIAN DAVID JOHNSON NOTES, IN THE GRASP OF THE GREAT DEPRESSION, “AIR OFFICERS KNEW THAT APPROPRIATIONS WOULD BE SCARCE AND THAT THE DOCTRINE THAT PREVAILED WOULD PROBABLY RECEIVE WHAT LITTLE FUNDING WAS AVAILABLE.” WHEN BOMBARDMENT EVENTUALLY WON THE DEBATE, IT GOT MORE APPROPRIATIONS FOR NEW EQUIPMENT AND GREATER ATTENTION TO PERSONNEL APPROPRIATIONS THAN PURSUIT.⁸⁴ THUS, THE CONFLICT BETWEEN FIGHTERS AND BOMBERS NOT ONLY ALTERED AIR CORPS TACTICS BUT IT ALTERED THE FORCE STRATEGICALLY AS WELL. IT MOLDED PURSUIT DOCTRINE TOWARDS THE DEFENSIVE AND SHAPED THE FUTURE FORCE STRUCTURE OF THE AIR CORPS TOWARDS A MORE BOMBER CENTRIC FORCE.

⁸¹ ACTS, *Pursuit Aviation*, September 1933, 41.

⁸² Finney, *History of ACTS*, 76, 77.

⁸³ ACTS, *Pursuit Aviation*, October 1937, 4, AFHRA 248.101-8.

⁸⁴ Johnson, *FT&HB*, 157, 166.

Chapter 3

Defending Pursuit Aviation: 1935 to 1939

THE MODERN PURSUIT PLANE REMAINS A POTENT WEAPON AGAINST THE MODERN HIGH SPEED BOMBER AND RETAINS IN FULL THE VALUE ATTRIBUTED TO IT IN THE PAST. LOSSES OF UNSUPPORTED BOMBARDMENT ATTACKED BY HOSTILE PURSUIT IN THE OPERATIONS IN CHINA WERE VERY HIGH, APPROXIMATELY THREE OR FOUR BOMBERS LOST TO ONE PURSUIT PLANE.

*- CAPT A. J. KERWIN MALONE
ACTS, 1938 TO 1939*

PURSUIT AVIATION IN THE GENERAL HEADQUARTERS AIR FORCE (GHQ AF) YEARS FROM 1935 TO 1939 DID NOT STRUGGLE TO FIND ITS IDENTITY. FIRMLY ENSCONCED IN THE ROLE OF HOMELAND DEFENSE, PURSUIT AVIATION BEGAN A GRADUAL RECOVERY FROM ITS LOW POINT FOLLOWING THE CONFLICT WITH BOMBARDMENT. IN THE AIR CORPS TACTICAL SCHOOL (ACTS), PURSUIT AVIATION BEGAN TO REGAIN SOME OF ITS LOST STATUE. BY THE END OF THIS ERA, COL MILLARD F. HARMON, ASSISTANT COMMANDANT OF ACTS COULD ARGUE, "WE ASSIGN PURSUIT A VERY IMPORTANT ROLE SECOND ONLY IN IMPORTANCE TO THE MAIN DEPENDENCE PLACED ON THE STRIKING FORCE."¹ PURSUIT AVIATION, HOWEVER, DID NOT REGAIN THE POSITION OF IMPORTANCE IT HAD ENJOYED AFTER WORLD WAR I. INSTEAD, IT FOCUSED ON PERFECTING TACTICS AND TECHNOLOGY TO OPERATE WITHIN THE LIMITED DEFENSIVE ROLE INTO WHICH IT HAD BEEN CAST.

The Focus of GHQ Air Force and Pursuit Doctrine

HITLER'S RISE TO POWER AND THE FORMATION OF THE AXIS ALLIANCE OF GERMANY, ITALY, AND JAPAN IN 1937 CLARIFIED AMERICAN STRATEGIC THINKING AND MILITARY DOCTRINE. THE THREAT OF AXIS ENCROACHMENT THROUGH SOUTH AMERICA GAVE THE AIR FORCE A CLEAR MISSION OF HEMISPHERIC DEFENSE THAT ENCOMPASSED ALL FORMS OF AVIATION.² TO PROTECT THE SECURITY OF THE UNITED STATES, THE MILITARY AND THE AIR FORCE NEEDED TO PREVENT THE AXIS POWERS FROM ESTABLISHING A FORWARD POSITION ANYWHERE IN THE WESTERN HEMISPHERE. MAJ GEN FRANK ANDREWS, THE COMMANDER OF GHQ AIR FORCE, NOTED THE MISSION OF THE AIR FORCE IN PROVIDING AIR DEFENSE FOR THE UNITED STATES IN A SPEECH TO THE NATIONAL AERONAUTICAL ASSOCIATION THAT ALSO HIGHLIGHTED THE SPLIT IN THE AIR CORPS

DEFENSE AGAINST AIR ATTACK IS ACCOMPLISHED TWO WAYS—BY MEETING THE ENEMY IN THE AIR AND FIGHTING HIM OFF, AND BY PREVENTING HIM FROM TAKING TO THE AIR AT ALL. ONE METHOD EMPLOYS PURSUIT AIRPLANES AND ANTI-AIRCRAFT GUNS TO DEFEND PREDETERMINED VITAL POINTS; AND THE OTHER SENDS BOMBERS AGAINST ENEMY BASES OR AIRCRAFT CARRIERS.³

OF THE TWO MISSIONS, PURSUIT AVIATION WAS FIRMLY ROOTED IN THE FORMER. FOR THE LATTER MISSION, PURSUIT WAS DEEMED INCAPABLE AND NOT REQUIRED. BRIG GEN JAMES E. CHANEY, COMMANDER OF THE AIR CORPS TRAINING CENTER AT RANDOLPH FIELD, TEXAS, ELABORATED, "IT IS APPARENT... THAT BOMBARDMENT, PURSUIT, ATTACK, AND OBSERVATION OPERATE AS AN AIR FORCE TO GET THE BEST RESULTS; THAT WHILE EACH IN ITS ACTIONS CONTRIBUTES TO THE

¹ Col Millard F. Harmon, 1939, quoted in Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm 1917-1941* (1955; reprint, Washington, D.C.: Office of Air Force History, 1985), 83.

² Greer, 76.

³ Maj Gen Frank M. Andrews, chief of the GHQ Air Force, "Air Defense," address to Cleveland Women's Chapter of the National Aeronautical Association, 2 September 1937, in *Army and Navy Journal* LXXV, no. 2 (11 September 1937): 4.

SUCCESS OF THE BOMBARDMENT MISSION, BOMBARDMENT WHEN IN THE AIR NEITHER REQUIRES NOR EXPECTS PROTECTION OTHER THAN ITS OWN DEFENSIVE MEANS."⁴ IN SHORT, PURSUIT SUPPORTED BOMBARDMENT BY DEFENDING THE BOMBERS ON THE GROUND.

FOR EFFECTIVE DEFENSE, PURSUIT RELIED ON DENYING FREEDOM OF ACTION TO HOSTILE FORCES. PURSUIT COULD DENY FREEDOM OF ACTION IN THREE WAYS: DESTRUCTION, ATTRITION AND THREAT OF ACTION. FIRST, IT COULD DESTROY ENEMY AIRCRAFT. THE DESTRUCTION OF HOSTILE AIRCRAFT DEPRIVED THE ENEMY OF WEAPONS WITH WHICH TO WAGE WAR. SECOND, PURSUIT COULD REDUCE THE ENEMY FORCE'S WILL AND ABILITY TO WAGE WAR. THROUGH ATTRITION, PURSUIT SOUGHT TO REDUCE "THE ENEMY FORCES BY CASUALTIES IN AIR COMBAT TO SUCH AN EXTENT THAT THEIR OPERATIONS BECOME EXPENSIVE IN PERSONNEL AND MATERIAL SO THAT THEIR MORALE IS LOWERED AND THEIR MEANS AND WILL TO CONTINUE AIR WARFARE IS ADVERSELY AFFECTED." WHILE ATTRITION AND DESTRUCTION BOTH RELY UPON DESTROYING ENEMY AIRCRAFT, ATTRITION VARIES FROM DESTRUCTION IN THAT ITS MECHANISM OF SUCCESS IS REDUCING THE ECONOMIC CAPABILITY AND WILL OF THE ENEMY TO CONTINUE THE WAR, WHEREAS DESTRUCTION DIRECTLY NEGATES THE ENEMY'S WEAPONS. THE FINAL MEANS THROUGH WHICH PURSUIT ACCOMPLISHED ITS GOAL WAS BY THE THREAT OF AN ATTACK. THE MERE PRESENCE OF PURSUIT FORCES REDUCED BOMBING EFFICIENCY BY FORCING BOMBERS TO CARRY MORE DEFENSIVE ARMAMENT AND ARMOR IN LIEU OF WEAPONS OR FUEL. FURTHER, HOSTILE PURSUIT REQUIRED BOMBERS TO FLY IN LARGE FORMATIONS, RESTRICTING THEIR BOMBING ACCURACY AND MANEUVERABILITY.⁵ PURSUIT PROPONENTS IN THE AIR CORPS RELIED ON THE IMPLIED THREAT OF PURSUIT AVIATION IN PART BECAUSE THE VAST EXPANSE OF THE UNITED STATES PREVENTED A CONCENTRATED DEFENSE AT ALL POINTS. IN FACT, AIRMEN ENVISIONED A THIN LINE OF GENERAL DEFENSE SUPPLEMENTED BY HEAVY CONCENTRATIONS FOR IMPORTANT LOCAL AREAS. MAJ JAMES E. PARKER, THE CHIEF OF THE PURSUIT SECTION AT ACTS FROM 1936 TO 1940, ESTIMATED THAT THE THREAT OF PURSUIT ALONE WOULD REDUCE BOMBERS' PAYLOADS BY AS MUCH AS 35 PERCENT, BECAUSE OF THE ADDED DEFENSIVE ARMOR AND ARMAMENT.⁶

AN ADDITIONAL FACTOR INFLUENCING PURSUIT DEVELOPMENT WAS THE RELATIVE ISOLATION OF THE UNITED STATES FROM ITS POTENTIAL THREATS. THE RELATIVE ISOLATION FOCUSED PURSUIT EFFORTS TOWARDS DEFENSE BECAUSE IT ALLEVIATED SOME OF THE NEED FOR AN OFFENSIVE STRIKING FORCE AND PROVIDED AN ADDED LAYER OF SECURITY FOR THE UNITED STATES. MCCORMICK, IN HIS 1938 ACTS THESIS, NOTED THAT DUE TO COMPARATIVELY SHORT RANGES BETWEEN COUNTRIES, THE EUROPEANS "VALUE PURSUIT PROTECTION SOMEWHAT HIGHER THAN DO AUTHORITIES IN THIS COUNTRY, WHERE A FORTUNATE GEOGRAPHIC LOCATION LENDS A FEELING OF COMPARATIVE SECURITY."⁷ HE FURTHER CONTENDED THAT FOR THE UNITED STATES, DISTANCES FROM HOSTILE NATIONS WERE SO GREAT AS TO PRECLUDE PURSUIT USEFULNESS OUTSIDE OF ITS DEFENSIVE ROLE. CONSEQUENTLY, US PURSUIT COULD FOCUS AGAINST ENEMY BOMBARDMENT AS ITS EXPECTED THREAT, SINCE ENEMY PURSUIT WOULD NOT HAVE THE RANGE TO REACH THE UNITED STATES. NEVERTHELESS, PURSUIT AVIATION DID NOT COMPLETELY GIVE UP ON AN OFFENSIVE ROLE. PURSUIT INSTRUCTORS AT ACTS CONTINUED TO TEACH ESCORT TACTICS EVEN THOUGH THE MINDSET OF PURSUIT WAS DEFENSIVE.

THE 1939 *PURSUIT AVIATION* TEXT RECOGNIZED THE REQUIREMENT FOR PURSUIT TO PROTECT BOMBARDMENT, ATTACK, AND OBSERVATION AIRCRAFT BOTH ON THE GROUND AND *IN THE AIR*. EVEN THOUGH THE TEXT RECOGNIZED THAT "PURSUIT AVIATION WILL BE EMPLOYED FOR A GREAT MAJORITY OF THE TIME ON DEFENSIVE MISSIONS," IT ALSO NOTED THE IMPORTANCE OF MAINTAINING OFFENSIVE SUPPORT CAPABILITY. THE TEXT LISTED TWO MISSIONS WHEREBY PURSUIT PROTECTED FRIENDLY AVIATION. THE FIRST, "SPECIAL SUPPORT," ENTAILED CLOSE ESCORT WHERE THE PURSUIT "REMAINS ALWAYS IN QUICK SUPPORTING DISTANCE" OF THE ATTACKERS AND "GENERAL SUPPORT." PURSUIT GAVE

⁴ Brig Gen James E. Chaney, "Yesterday and Today," *Air Corps News Letter* XIX, no. 7 (1 April 1936): 2 and "Major General James E. Chaney," *Air Force Link*, on-line, Internet, 8 May 2005, available from <http://www.af.mil/bios/bio.asp?bioID=4973>.

⁵ Capt E. K. Warburton, "Pursuit Tactics and Technique," (Maxwell Field, Ala.: thesis, Air Corps Tactical School, 1938), 2, AFHRA 248.282-37.

⁶ Greer, 84.

⁷ Capt Harlan T. McCormick, "History and Development of Pursuit Aviation" (Maxwell Field, Ala.: thesis, Air Corps Tactical School, 1938), 24, AFHRA 248.282-36.

GENERAL SUPPORT BY "KEEPING CERTAIN SECTORS OR AREAS CLEAR OF ENEMY AIRCRAFT, I.E., OBTAINING A TEMPORARY AIR SUPERIORITY OVER THIS AREA."⁸

BY RETAINING A LEVEL OF CORE INSTRUCTION IN THE ESCORT ROLE, PURSUIT INSTRUCTORS MAINTAINED, AT LEAST AT A MINIMUM LEVEL, THE BASIC DOCTRINE TO ENABLE PURSUIT AVIATION TO RESUME ESCORT RESPONSIBILITIES IF REQUIRED. EXACTLY HOW MUCH TIME ACTS SPENT ON PROTECTION MISSIONS IS UNKNOWN, BUT THE 1938-39 ACTS'S SYLLABUS INCLUDED A ONE-HOUR CONFERENCE ENTITLED "PURSUIT IN SUPPORT OF THE AIR FORCE," WHICH CLOSELY PARALLELED THE SCHOOL'S PURSUIT TEXT.⁹ OF NOTE, PURSUIT EMPLOYMENT IN WORLD WAR II REFLECTED THE TECHNIQUES DESCRIBED IN BOTH THE LECTURE AND TEXT. DURING THE WAR, FIGHTER GROUPS ASSIGNED TO ESCORT DUTIES FLEW BOTH CLOSE SUPPORT AND GENERAL SUPPORT MISSIONS. INITIALLY, MOST ESCORT WAS CLOSE SUPPORT, BUT AS THE WAR PROGRESSED, PURSUIT BEGAN TO FLY MORE GENERAL SUPPORT MISSIONS. AT TIMES ESCORT FIGHTERS EMPLOYED BOTH TECHNIQUES. SOME SQUADRONS WOULD STAY WITH THE BOMBERS TO PROVIDE CLOSE ESCORT WHILE OTHERS WOULD ROAM THE AREA AHEAD LOOKING TO ENGAGE THE ENEMY INTERCEPTORS ON THEIR TERMS.¹⁰

Pursuit Aircraft Development

NOT SURPRISINGLY, THE PRIMARY FOCUS ON THE DEFENSIVE MISSION RESULTED IN AN AIRCRAFT DEVELOPED FOR THAT ROLE. TWO TYPES OF FIGHTERS FIT THIS BILL, A FAST, QUICK-CLIMBING, HEAVILY-ARMED INTERCEPTOR TO ATTACK BOMBERS AND A SMALLER, MORE MANEUVERABLE, COMPROMISE PURSUIT AIRCRAFT ABLE TO MATCH THE PERFORMANCE OF HOSTILE PURSUIT AND RAPIDLY SCRAMBLE OFF ALERT. THE AIR CORPS ALSO PROPOSED A THIRD TYPE OF FIGHTER FOR ESCORT. CALLS MOSTLY FROM THE BOMBER COMMUNITY CAUSED THE AIR CORPS TO EXPERIMENT WITH A MULTI-ENGINE, LONG-RANGE PURSUIT AIRCRAFT TO FIT THIS BILL.¹¹ THUS, THE AIR CORPS SET OUT TO PRODUCE THREE TYPES OF PURSUIT AIRCRAFT: A COMPROMISE FIGHTER, AN INTERCEPTOR, AND A MULTI-ENGINE ESCORT.

THE COMPROMISE FIGHTER, SO NAMED BECAUSE IT COMPROMISED SPEED, MANEUVERABILITY, AND RANGE TO GET AN AIRCRAFT THAT PERFORMED ADEQUATELY IN EACH AREA, WAS THE PREDOMINANT FIGHTER IN THE AIR CORPS INVENTORY, BECAUSE IT WAS VERSATILE ENOUGH TO ACCOMPLISH MOST MISSIONS. THE P-26 AND THE FOLLOW-ON P-35 AND P-36 WERE COMPROMISE FIGHTERS. THE P-35 AND P-36 WERE THE FIRST MODERN FIGHTERS INCORPORATING THE TECHNOLOGICAL ADVANCES ALREADY IN BOMBERS. THE FOLLOW-ON P-40, FIRST FLOWN IN 1938, WAS AN EXTENSION OF THE SAME AIRFRAME AS THE P-36 WITH AN INLINE LIQUID-COOLED ENGINE THAT GAVE IT A 40 MILE PER HOUR SPEED ADVANTAGE OVER THE P-36. THE UNITED STATES ENTERED THE WAR WITH THE P-40 AS ITS MAIN PURSUIT FIGHTER. THE P-40, AS A COMPROMISE FIGHTER, WAS GOOD AT MOST MISSIONS, BUT NOT DESIGNED TO EXCEL AT ANY SPECIFIC MISSION.¹²

IN CONTRAST TO THE P-40, THE AIR CORPS, IN 1937, CONTRACTED FOR THE PRODUCTION OF THE P-38 AND P-39 SPECIFICALLY TO BE INTERCEPTORS. AS INTERCEPTORS, THEY REQUIRED LARGER GUNS AND A BETTER ABILITY TO CLIMB RAPIDLY TO HIGH ALTITUDES. THE P-39, DELIVERED IN APRIL OF 1940, FAILED AS AN INTERCEPTOR DUE TO A POOR CLIMB CAPABILITY, BUT MET WITH LIMITED SUCCESS IN THE AIR-TO-GROUND ROLE DUE TO ITS LARGE 37-MILLIMETER CANNON. THE P-38, DELIVERED SEPTEMBER 1940, WENT ON TO BE A VERY VERSATILE AND USEFUL FIGHTER.¹³ ITS INHERENT LONG-RANGE ENABLED IT TO BE A VERY SUCCESSFUL PLANE IN THE PACIFIC.¹⁴

⁸ ACTS, *Pursuit Aviation*, September 1939, 67-68, AFHRA 248.101-8.

⁹ Capt E. E Partridge, "Pursuit in Support of the Air Force," lecture, ACTS, Maxwell Field, Ala., 13 December 1938. AFHRA 248.2808-17.

¹⁰ William R. Emerson, "Operation POINTBLANK: A Tale of Bombers and Fighters," Harmon Memorial Lecture, United States Air Force Academy, Colo., 27 March 1962, 467.

¹¹ Capt Y. H. Taylor, "Pursuit Aviation" (Maxwell Field, Ala.: thesis, Air Corps Tactical School, 1937), 14, AFHRA 248.282-11 and Lt Col H. H. Arnold, letter to the Chief of the Air Corps, subject: Employment of Tactical Units Equipped with Modern Pursuit and Bombardment Airplanes, 26 November 1934, 17, AFHRA 248.282-27

¹² Greer, 85-86.

¹³ Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York, N.Y.: Random House, 1993), 107-115. While test variants of both aircraft were delivered in 1940, combat variants were not produced until late 1941. In 1940, the Air Corps only procured one P-38 and thirteen P-39s. The first

THE LARGE, MULTI-PLACE ESCORT FIGHTER NEVER GOT PAST THE EXPERIMENTAL STAGE. AN AIR CORPS BOARD IN 1935 REVIEWED THE NEED FOR THE MULTI-PLACE FIGHTER, DETERMINING THAT A FIGHTER OF EQUAL RANGE TO THE BOMBER WOULD NOT HANDLE ADEQUATELY AS A PURSUIT AIRCRAFT. HENCE THE BOARD RECOMMENDED, "THAT NO ATTEMPT BE MADE TO BUILD AN EXPERIMENTAL AIRPLANE HAVING THE PERFORMANCE CHARACTERISTICS... INCLUDING THE RANGE OF BOMBARDMENT WITH THE PERFORMANCE OF PURSUIT."¹⁵ INSTEAD, THE BOARD RECOMMENDED A LARGE MULTI-PLACE, CONVOY ESCORT WITH A CEILING HIGHER AND A SPEED AT LEAST 25 PERCENT GREATER THAN THAT OF BOMBARDMENT AIRCRAFT. HOWEVER, THE BOARD QUALIFIED THE NEED FOR THE PLANE AND MADE IT A LOW PRIORITY. THE BOARD NOTED, "THE NEED FOR INTERCEPTOR TYPE PURSUIT IS AT PRESENT GENERALLY RECOGNIZED WHILE THE NEED FOR ADDITIONAL SUPPORT FOR BOMBARDMENT HAS NOT YET BEEN THOROUGHLY DEMONSTRATED.... BOMBARDMENT SHOULD EXHAUST EVERY CONCEIVABLE MEANS OF DEFENDING ITSELF BEFORE ADDITIONAL SUPPORT IS PROVIDED." HENCE, THE BOARD CONCLUDED, "THAT AN EXPERIMENTAL FIGHTER BE DEVELOPED... ONLY IF IT DOES NOT INTERFERE IN ANY WAY WITH PROGRESS IN THE DEVELOPMENT OF BOMBARDMENT, ATTACK, OBSERVATION, AND INTERCEPTOR TYPE PURSUIT UNTIL SUCH TIME AS THE NEED FOR THIS TYPE HAS BEEN THOROUGHLY DEMONSTRATED."¹⁶ IN EFFECT, THE BOARD'S RESPONSE ISSUED A DEATH SENTENCE TO THE MULTI-ENGINE FIGHTER.

EVEN MORE DAMAGING TO THE MULTI-PLACE FIGHTER WAS THE MATERIEL DIVISION'S OPINION AFTER TESTING AN ESCORT FIGHTER BASED UPON A B-10 TYPE AIRFRAME. THE MATERIAL DIVISION FOUND THAT THE MODIFICATIONS TO ADAPT THE PLANE TO THE DESIRED SPECIFICATIONS ADDED WEIGHT TO THE POINT THAT ITS PERFORMANCE WAS LESS THAN THE ORIGINAL BOMBER. IT CONCLUDED, "IT IS THE OPINION OF THE MATERIEL DIVISION THAT [THE MULTI-PLACE FIGHTER] IS NOT AN EFFICIENT MILITARY WEAPON, AN OPINION BORNE OUT BY THE COMPARATIVELY LOW PERFORMANCE FIGURE OF SUCH TYPES."¹⁷

DESPITE OF THE BOARD'S FINDINGS AND TEST DATA, THE AIR CORPS WENT AHEAD WITH DEVELOPMENT OF A MULTI-PLACE FIGHTER FOR ESCORT. DESIGNED IN 1935 AND FLOWN IN 1937, THE XFM-1 WAS THE AIR CORPS ANSWER TO THE ESCORT FIGHTER. AS PREDICTED BY THE BOARD, THE XFM-1 WAS A SITTING DUCK FOR SINGLE-SEAT PURSUIT AIRCRAFT AND A NIGHTMARE FOR MECHANICS AS WELL. THE AIR FORCE ABANDONED XFM-1 EFFORTS AFTER BUYING JUST 13 FOR TEST PURPOSES. CHENNAULT NOTES IN HIS AUTOBIOGRAPHY THAT AS A MEMBER OF THE AIR CORPS BOARD HE VIGOROUSLY ARGUED AGAINST THE DEVELOPMENT OF THE XFM-1 BECAUSE IT WAS AS VULNERABLE TO FIGHTERS AS THE BOMBERS IT TRIED TO PROTECT, CALLING IT A WASTE, EXCEPT AS A GUINEA PIG FOR STUDENT MECHANICS.¹⁸

THE FAILURE OF THE LONG-RANGE ESCORT LEFT OPEN AN AREA OF OPERATIONS STILL CONTESTED BETWEEN FIGHTERS AND BOMBERS. COULD BOMBARDMENT SUCCEED WITHOUT ESCORT? PURSUIT AVIATORS DID NOT FOCUS ON THIS QUESTION SPECIFICALLY. INSTEAD, THEY SET OUT TO PROVE THEY COULD INTERCEPT AND DESTROY MODERN BOMBERS. THESE OBJECTIVES SERVED AS THE IMPLICIT STRUCTURE FOR THE EXERCISES AND TRAINING OF PURSUIT GROUPS AS THEY SOUGHT TO PROVE THE EFFICACY OF PURSUIT AVIATION IN ITS DEFENSIVE ROLE.

Pursuit Exercises and Maneuvers

THE FOCUS OF PURSUIT EXERCISES CLEARLY HIGHLIGHTS THE EXPECTED DEFENSIVE ROLE OF PURSUIT AVIATION. THE MAJORITY OF THE PURSUIT EXERCISES SPECIFICALLY TESTED THE ABILITY OF PURSUIT AIRCRAFT TO LOCATE, INTERCEPT, AND SHOOT DOWN BOMBARDMENT AND ATTACK AVIATION. A

combat variant of the P-38, the P-38E, did not go into production until November 1941. Irving Brinton Holley, Jr., *Buying Aircraft: Material Procurement for the Army Air Forces* (Washington, D.C.: Center of Military History, 1989), 550.

¹⁴ Greer, 86 and Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington, D.C.: Office of Air Force History, 1987), 436.

¹⁵ Report of the Air Corps Board, "Study No. 2: Multi-Engine Fighter Aircraft" (Maxwell Field, Ala., 15 July 1935), 2, AFHRA 167.5-2.

¹⁶ Air Corps Board, "Study No. 2," 3.

¹⁷ *Ibid.*, 6.

¹⁸ Claire Lee Chennault, *Way of a Fighter* (1949, reprint Tucson, Ariz.: James Thorvardson & Sons, 1991), 29-30 and Maurer, 364.

GOOD EXAMPLE IS THE DECEMBER 1935 FLORIDA MANEUVERS OF THE 3RD WING FROM BARKSDALE FIELD, LOUISIANA. THE WING'S ATTACK AND BOMBER AIRCRAFT DEPLOYED TO FORT PIERCE, FLORIDA WHILE ITS PURSUIT DEPLOYED TO MIAMI. THE 77TH PURSUIT SQUADRON COMBINED WITH THE 27TH PURSUIT GROUP FROM SELFRIDGE FIELD, MICHIGAN TO COMPRISE THE 20TH PURSUIT GROUP. THE PURSUIT GROUP, UNDER THE COMMAND OF BRIG GEN HENRY C. PRATT, DEFENDED MIAMI FROM THE ATTACK AND BOMBARDMENT AIRCRAFT OF THE 3RD WING. ON THE FIRST DAY OF THE EXERCISE, 36 PURSUIT AIRCRAFT TOOK OFF WITHIN FOUR MINUTES OF NOTIFICATION AND "ANNIHILATED" THE INBOUND BOMBERS IN A 10-MINUTE BATTLE. THROUGHOUT THE EXERCISE, GOOD COMMUNICATIONS AND OBSERVATION ENABLED PRATT TO DESTROY THE ENEMY BOMBERS REPEATEDLY, THE EXCEPTION BEING WHEN THE BOMBERS AND ATTACK AIRCRAFT SIMULTANEOUSLY STRUCK MIAMI OR THE BOMBER FORCE SPLIT ITS FORCES APART.¹⁹

IN ADDITION TO MANEUVERS, THE GHQ AIR FORCE TACTICAL INSPECTOR FOCUSED ON INTERCEPTION TO JUDGE THE EFFECTIVENESS OF A PURSUIT SQUADRON. FOR INSTANCE, THE 29 APRIL 1937 PRACTICAL TEST EVALUATED THE ABILITY OF A PURSUIT SQUADRON COMMANDER TO "LEAD AND NAVIGATE HIS SQUADRON FROM DISPERSED AIRDROMES TO A GROUP ASSEMBLY...AND TO MAKE AN INTERCEPTION USING NAVIGATIONAL DATA TRANSMITTED TO THEM BY THE GROUP RADIO STATION." THE FOCUS OF THE EVALUATION WAS TO SIMULATE WARTIME EMPLOYMENT OF PURSUIT AIRCRAFT. THE INSPECTORS GRADED THE PURSUIT SQUADRONS ON THEIR ABILITY TO TAKE OFF FROM ALERT AT DISPERSED AIRFIELDS, REJOIN AS A SQUADRON, AND INTERCEPT A HOSTILE FORCE. TO ASSIST IN THE EVALUATION, THE INSPECTORS EMPLOYED A SIMULATED WARNING NETWORK TO PROVIDE TIMELY INPUTS INTO THE EXERCISE.²⁰

FOR PURSUIT MISSIONS TO SUCCEED, THE PILOTS HAD TO FIND AND INTERCEPT HOSTILE BOMBERS. HENCE, DEVELOPING A WORKABLE WARNING NETWORK WAS CRUCIAL TO THE SUCCESS OF PURSUIT AVIATION AND THUS BECAME A FOCUS OF SEVERAL EXERCISES. WHEN A REAL NETWORK COULD NOT BE USED, PURSUIT PILOTS SIMULATED NETWORKS BY HAVING THE OPPOSING BOMBERS CALL THEIR POSITION OUT OVER THE RADIO. THE PREVIOUSLY MENTIONED FLORIDA MANEUVERS AS WELL AS THE 1938 NORTHEAST MANEUVERS OUT OF MITCHEL FIELD, NEW YORK, EMPLOYED SIMULATED NETWORKS IN THIS FASHION.²¹ THE 1ST WING AT MARCH FIELD, CALIFORNIA, TESTED AN ACTUAL NETWORK IN 1937 AND AGAIN IN 1938. IN 1937, EMPLOYEES OF SOUTHERN CALIFORNIA EDISON COMPANY AT 11 POWERHOUSES AND SUBSTATIONS COMPRISED THE NETWORK. IN 1938, EMPLOYEES AT FOUR PUBLIC UTILITIES, A RAILROAD, AND THREE GOVERNMENT AGENCIES COMBINED TO FORM AN EXPANDED NETWORK OF 85 OBSERVATION POSTS; THEY USED TELEPHONES TO RELAY REPORTS OF AIRCRAFT SIGHTINGS TO MARCH FIELD. THE 1938 NETWORK AVERAGED 5 MINUTES FROM INITIAL AIRCRAFT SIGHTINGS UNTIL THE REPORTS REACHED MARCH FIELD, ALMOST DOUBLE THE 2.65 MINUTES TAKEN DURING THE 1933 FORT KNOX EXERCISE. REGARDLESS, THE NETWORK PROVED INVALUABLE TO PURSUIT AVIATION AND ALLOWED SUCCESSFUL INTERCEPTIONS.²²

THE MOST SIGNIFICANT PURSUIT EXERCISE TO TEST A NETWORK WAS AT FORT BRAGG, NORTH CAROLINA IN OCTOBER OF 1938. THE EXERCISE PITTED NEW B-17S, AS WELL AS OLDER B-18S, B-10BS, AND A-16S, AGAINST P-35S AND PB-2AS.²³ THE BOMBERS AND ATTACK AIRCRAFT FLEW IN FROM THE ATLANTIC OCEAN, SIMULATING RAIDS BY HOSTILE CARRIER-BASED AIRCRAFT. THE NETWORK WAS MADE UP OF 1,800 OBSERVERS, TWO-THIRDS OF WHOM WERE CIVILIAN VOLUNTEERS FROM ALL WALKS OF

¹⁹ "Barksdale Field Personnel in Florida Maneuvers," *Air Corps News Letter* XIX, no. 2 (15 January 1936): 22 and Maurer, 336-338.

²⁰ 1Lt J. M. Sterling, memorandum to Chief, Pursuit Section ACTS, subject: Operating Data – Pursuit Problem, 29 April 1937, 1, AFHRA 248.282.

²¹ Before 1941, the United States did not have a standing defense network. When the Japanese attacked at Pearl Harbor, the continental Aircraft Warning Service was only in the formative stage and not an effective system. Wesley Frank Craven and James Lea Cate, eds., *The Army Air Force in World War II*, vol. 1, *Plans and Early Operations: January 1939 to August 1942* (Chicago, Ill.: The University of Chicago Press, 1948), 286-293.

²² Maurer, 415-417.

²³ The PB-2A was a two-seater pursuit. It was the first retractable gear pursuit fighter purchased by the Air Corps. The Air Corps purchased 50 for production in December 1934. National Museum of the USAF, "Consolidated P-30," online, Internet, 7 May 2005, available from <http://www.wpafb.af.mil/museum/research/p30.htm>.

LIFE. THE OBSERVERS USED COMMERCIAL TELEPHONES WHERE AVAILABLE, SUPPLEMENTED BY RADIOS IN AREAS WITHOUT TELEPHONES, TO CONTACT ONE OF THREE CONTROL CENTERS. THE CONTROL CENTERS RELAYED THE OBSERVATIONS TO PURSUIT HEADQUARTERS, WHICH SCRAMBLED AND DIRECTED FIGHTER INTERCEPTS THROUGH RADIO BROADCASTS. THE NETWORK PERFORMED ADMIRABLY AND PURSUIT AIRCRAFT USUALLY INTERCEPTED THE BOMBERS WELL BEFORE THEY GOT TO THE TARGET AREA. OF NOTE, DURING ONE NIGHT OF THE EXERCISE PURSUIT AVIATION DID OPERATE IN COOPERATION WITH SEARCHLIGHTS AND THE NETWORK.²⁴ THE FORT BRAGG MANEUVERS FINALLY SILENCED THE DEBATE AS TO WHETHER PURSUIT COULD INTERCEPT BOMBERS EFFECTIVELY. IT COULD. THE NEXT YEAR'S ACTS *PURSUIT AVIATION* TEXT INCORPORATED A LARGE SECTION DESCRIBING A WARNING NETWORK. THE NETWORK FOLLOWED THE PROVISIONS LAID OUT BY CHENNAULT IN HIS 1933 MANUAL, THE *ROLE OF DEFENSIVE PURSUIT*, USING THE MODEL THAT HE HAD LARGELY COPIED FROM THE BRITISH. WITH THE PUBLICATION OF THE 1939 PURSUIT TEXT, CHENNAULT'S THEORY THAT PURSUIT COULD INTERCEPT BOMBERS FINALLY GAINED ACCEPTANCE AT ACTS AND IN THE AIR FORCE AS WELL.²⁵

LIKE MANY EXERCISES, THE RULES FOR THE FORT BRAGG EXERCISE MAY HAVE CREATED A FALSE IMPRESSION BY FAILING TO JUDGE THE LETHALITY OF THE PURSUIT ATTACKS. LIKE PREVIOUS EXERCISES, TO AVOID POTENTIAL MIDAIR COLLISIONS, PURSUIT AIRCRAFT COULD NOT GET CLOSER TO THE BOMBERS THAN 1,000 FEET.²⁶ THIS ARTIFICIAL LIMIT PREVENTED THE EXERCISE FROM DETERMINING HOW EFFECTIVE PURSUIT AIRCRAFT COULD BE AGAINST THE BOMBERS ONCE THEY INTERCEPTED THE BOMBERS BECAUSE EFFECTIVE GUN ATTACKS OCCURRED WITHIN 1,000 FEET. THIS LIMITATION LEFT OPEN THE QUESTION OF WHETHER OR NOT THE BOMBERS COULD SUCCESSFULLY SELF-DEFEND AGAINST PURSUIT ATTACKS.

THE ACTUAL EFFICACY OF PURSUIT AGAINST BOMBERS' DEFENSES WAS NOT DETERMINED UNTIL US FORCES ENTERED WORLD WAR II. NEVERTHELESS, BECAUSE IT WAS IMPORTANT TO PURSUIT'S SUCCESS, AIRMEN CONDUCTED SEVERAL STUDIES TO DETERMINE AND DEVELOP EFFECTIVE MEANS TO ATTACK BOMBERS DURING THE INTERWAR YEARS. IN JANUARY AND FEBRUARY 1937, AT WHEELER FIELD, HAWAII, THE 18TH PURSUIT GROUP EXPLORED THE FEASIBILITY OF PURSUIT ATTACKS AGAINST HOSTILE FORMATIONS. OPERATING AGAINST B-12S, THE 18TH TESTED SIMULTANEOUS ATTACKS FROM BOTH FLANKS AND THE REAR OF THE BOMBER, WITH A PREPONDERANCE OF THE PURSUIT AIRCRAFT STRIKING FROM THE REAR. THEY ALSO TESTED THE ACCURACY OF BOTH PURSUIT AND BOMBARDMENT GUNNERY AGAINST TOWED TARGETS AT VARIOUS ANGLES, RANGES, AND SPEEDS. OVERALL, THE 18TH PURSUIT GROUP FOUND THEIR TACTICS SOUND AND NOTED AN OVERWHELMING ADVANTAGE IN FAVOR OF THE PURSUIT AIRCRAFT. BY ATTACKING IN FORMATIONS OF THREE, THE PURSUIT AIRCRAFT GAINED A 6:1 ADVANTAGE IN THE NUMBER GUNS FIRING FROM A GIVEN ANGLE. THE REPORT FURTHER NOTED, "ONCE CONTACT HAS BEEN MADE, SUPERIOR SPEED, WHILE ADVANTAGEOUS, IS NOT ESSENTIAL TO EFFECTIVE ATTACK," DEBUNKING THE THEORY THAT A CO-SPEED BOMBER WOULD BE INVULNERABLE TO ATTACKING PURSUIT. IT ALSO POINTED OUT A SIGNIFICANT FINDING, "ROUND FOR ROUND OF AMMUNITION, A FIXED GUN IS CAPABLE OF MORE ACCURATE FIRE THAN A FLEXIBLE GUN. (THIS FROM A COMPARISON OF ALL PHASES WITH PURSUIT SCORES FIRED ON THE SAME SLEEVE TARGET.)"²⁷

THE PREVIOUSLY MENTIONED 1937 EXERCISES AT MARCH FIELD ALSO EVALUATED PURSUIT TACTICS WITH P-26S ATTACKING B-10S AT HIGH ALTITUDE. WITH ONLY A SMALL SPEED AND ALTITUDE ADVANTAGE, THE P-26S TRIED NUMEROUS ATTACK METHODS. THEY FOUND THAT THE HIGH CROSSING SPEEDS OF OFF-AXIS ATTACKS FROM THE SIDES OR THE FRONT QUARTER YIELDED A LOW PROBABILITY OF SUCCESS AND NEGATED ANY ADVANTAGE AN OFF AXIS ATTACK MIGHT YIELD. CONVERSELY, THE P-26S DEMONSTRATED CONSIDERABLE SUCCESS ATTACKING FROM LONG RANGE IN THE STERN. AT LONG RANGE, PURSUIT AIRCRAFT PRESENTED SMALL TARGETS FOR THE FLEXIBLE GUNNERS, WHERE AS THE PURSUIT PILOTS STILL HAD A LARGE TARGET AND MORE IMPORTANTLY, THEY HAD THE TIME TO AIM AND SHOOT THEIR WEAPONS. THEY CONCLUDED THAT THIS TACTIC, "PROMISED CONSIDERABLE SUCCESS AGAINST BOMBERS IN CLOSE FORMATION IF PURSUIT EMPLOYED LARGE GUNS CALIBRATED FOR LONG-RANGE FIRING."²⁸ THESE RESULTS WERE CONSISTENT WITH THE HAWAII FINDINGS, WHICH

²⁴ Maurer, 417-418.

²⁵ Greer, 85.

²⁶ Maurer, 417.

²⁷ 1Lt James E. Briggs, memorandum to Commanding Officer 18th Pursuit Group, subject: Cooperative Gunnery Problem with the 50th Observation Squadron, 1 March 1937, 1-6, AFHRA 242.282.

²⁸ Maurer, 401.

RECOMMENDED A PREPONDERANCE OF PURSUIT (2:1) TO THE STERN OF THE BOMBERS WITH FLANKING ATTACKS MADE PRIMARILY TO PREVENT THE BOMBERS FROM CONCENTRATING THEIR FIRE TO THE REAR. IN THE HAWAII TESTS, THE 18TH PURSUIT GROUP USED SUPERIOR NUMBERS OF PURSUIT FIGHTERS, THREE TO ONE, FIRING AT 500-700 FEET TO OVERWHELM THE REAR GUNNERS.²⁹

ACTS ALSO INVESTIGATED SOLUTIONS FOR ATTACKING BOMBERS. CAPT HAROLD H. GEORGE CAME TO THE SAME CONCLUSIONS AS THOSE OF THE MARCH EXERCISE IN HIS 1936-37 ACTS THESIS. HE THEORIZED THAT A PURSUIT FORCE WITH A SIZABLE FRACTION OF FIGHTERS EMPLOYING A CANNON WITH GREATER RANGE THAN THE ARMAMENT ON THE HOSTILE BOMBERS WOULD BE DEVASTATING TO THEIR FORMATION. FOR THE PURPOSE OF HIS ARGUMENT, HE NOTIONALLY LABELED STANDARD FIGHTERS AS A TYPE A, AND CANNON-EQUIPPED FIGHTERS AS TYPE B. HE ARGUED THAT A MIXTURE OF TYPE A AND TYPE B FIGHTERS WOULD BE THE MOST EFFECTIVE FORCE. AGAINST FORMATIONS OF BOMBERS THE TYPE B FIGHTER COULD FIRE AT BOMBERS FROM THE STERN WITH IMPUNITY. THE BOMBER FORMATION THEN HAD ONLY TWO OPTIONS: REMAIN TOGETHER AND SUFFER THE ATTACK OR SPREAD THE FORMATION. SPREADING FOR SURVIVAL WOULD MAKE THE BOMBERS VULNERABLE TO THE MORE NUMEROUS TYPE A FIGHTERS, WHO ALSO SERVED TO ENGAGE ANY ENEMY ESCORTS. HE CONCLUDED, "THERE ARE NO DEFENSIVE MEASURES THAT COULD POSSIBLY BE TAKEN BY AN ATTACKING FORCE WHICH WOULD AVOID ITS BEING TOTALLY DESTROYED IN COMBAT WITH A PURSUIT FORCE IN SUFFICIENT NUMBERS EMPLOYING TYPE B PURSUIT."³⁰ FROM HIS ANALYSIS, GEORGE RECOMMENDED IMMEDIATELY EQUIPPING A FRACTION OF THE CURRENT PURSUIT FIGHTERS WITH LARGER CANNONS TO ACT AS THE TYPE B FIGHTER. HE FURTHER PROPOSED A MORE PERMANENT SOLUTION OF DEVELOPING A DEDICATED INTERCEPTOR WITH GUNS LARGER THAN THOSE OF BOMBERS TO PICK UP THE TYPE B ROLE. THE AIR CORPS DESIGNED EXACTLY THIS INTERCEPTOR IN THE P-38 AND P-39. IT IS ALSO WORTH NOTING THAT THE GERMANS USED THE TACTIC DESCRIBED BY CAPTAIN GEORGE QUITE SUCCESSFULLY IN WORLD WAR II AGAINST UNESCORTED AMERICAN BOMBER FORMATIONS.³¹ MAJ GEN IRA C. EAKER, COMMANDER OF THE EIGHTH AIR FORCE WRITES, "THE GERMAN AIR FORCE NOW HAS TWO SQUADRONS OF FW 190'S EQUIPPED WITH 37 MM. CANNON. YESTERDAY, THEY STOOD OFF AT 1500 YDS., OUTSIDE OUR EFFECTIVE RANGE, AND KNOCKED DOWN THREE OF OUR BOMBERS WITH THIS LONG RANGE CANNON FIRE."³²

Evaluating Foreign Wars

THROUGH EXERCISES AND THEORY, PURSUIT AVIATORS COULD MAKE EDUCATED GUESSES AS TO THE EFFECTIVENESS OF PURSUIT GUNNERY VERSUS BOMBARDMENT AIRCRAFT. HOWEVER, PURSUIT AVIATORS AT ACTS ALSO ANALYZED REAL COMBAT BY EXAMINING BOTH OF THE MAJOR CONFLICTS OF THE 1930S, THE SPANISH CIVIL WAR AND THE SINO-JAPANESE WAR.

THE SPANISH CIVIL WAR PITTED RUSSIAN AIRCRAFT FIGHTING FOR THE LOYALISTS (REPUBLICANS) AGAINST GERMAN AND ITALIAN AIRCRAFT FIGHTING FOR THE INSURGENTS (NATIONALISTS) FROM 1936 TO 1939. WRITING IN 1938, CAPTAIN MCCORMICK, AN ACTS STUDENT, NOTED THAT CONTRARY TO COMMON OPINION, THE AIRCRAFT IN SPAIN WERE NOT OBSOLETE, BUT THE PLANES WERE "SOME OF THE BEST IN THE WORLD, MANNED BY SKILLFUL, WELL-TRAINED PILOTS." HE MAINTAINED, "THE USE OF AIR POWER IN THE WAR IN SPAIN CERTAINLY CANNOT BE CONSIDERED A SIDE-SHOW." IN EXAMINING EMPLOYMENT FROM BOTH SIDES, MCCORMICK MADE THE FOLLOWING ANALYSIS. FIRST, THE LOYALISTS EMPLOYED A GROUND-BASED ALERTING NETWORK, TO GREAT SUCCESS. THE

²⁹ Briggs, 1-6.

³⁰ Maj H. H. George, "Pursuit Aviation: Employment of Type A and Type B Pursuit Airplanes" (Maxwell Field, Ala.: thesis, Air Corps Tactical School, 1936-1937), V-1, AFHRA 248.282-30.

³¹ Capt George, was the Chief of Staff for the Fifth Interceptor Command in the Philippines when the Japanese attacked on 8 December 1941. He took over command of the Air Forces in the Philippines when Maj Gen Brereton departed for Australia on 24 December 1941. From then until the fall of the Philippines, George commanded a small force of mostly P-40s, trying to slow the Japanese invasion. While defending the Philippines he developed many of the tactics later used by the Fifth Air Force against the Japanese. Walter D. Edmonds, *They Fought with What They Had* (1951; reprint, Washington, D.C.: Center for Air Force History, 1992), 196, 30-38, 360-361.

³² Maj Gen Ira C. Eaker, 18 May 1943, quoted in David E. Johnson, *Fast Tanks and Heavy Bombers* (Ithaca, N.Y.: Cornell University Press, 1998), 207.

NETWORK SUCCEEDED DESPITE THE FACT THAT THE LOYALISTS HAD REMOVED THE RADIOS FROM THEIR AIRCRAFT TO INSTALL EXTRA ARMOR BEHIND THE PURSUIT PILOTS, MEANING THAT THEY COULD NOT RECEIVE ANY DIRECTIONS TO THE ENEMY AIRCRAFT AFTER THEY TOOK OFF. SECOND, BOTH SIDES FOUND THE USE OF ESCORT FIGHTERS NECESSARY TO DEFEND THEIR BOMBERS. HE QUOTES ROYAL AIR FORCE WING COMMANDER GADE, AN OFFICIAL OBSERVER FROM GREAT BRITAIN, "THE ESCORT OF BOMBER FORMATIONS PROCEEDING TO AND FROM THEIR OBJECTIVES BY DOUBLE, OR MORE THAN DOUBLE, THEIR NUMBER OF FIGHTERS, HAS BEEN FOUND BY BOTH SIDES TO BE A NECESSITY, NOTWITHSTANDING THE ABILITY OF THE BOMBER TO SHOOT DOWN FIGHTERS."³³ FINALLY, MCCORMICK OBSERVED, "AS DURING THE LATTER STAGES OF THE WORLD WAR, LOYALISTS HAVE USED PURSUIT TO CONSIDERABLE ADVANTAGE AGAINST GROUND TROOPS" EMPLOYING BOTH BOMBS AND MACHINE GUN FIRE.³⁴

MCCORMICK COMBINED HIS OBSERVATIONS OF THE SPANISH CIVIL WAR WITH THOSE OF THE SINO-JAPANESE WAR TO REACH THE FOLLOWING CONCLUSIONS:

- a. BOMBARDMENT SHOULD HAVE PURSUIT PROTECTION
- b. MODERN BOMBARDMENT ARMAMENT DOES NOT GIVE SUCH PROTECTION AS TO MAKE THE PURSUIT THREAT NEGLIGIBLE.
- c. PURSUIT WILL SUFFER SEVERE LOSSES IN ATTACK AGAINST MODERN BOMBARDMENT....³⁵
- d. PURSUIT PROBABLY CANNOT KEEP ALL OF A BOMBARDMENT UNIT FROM REACHING ITS OBJECTIVE, BUT CAN INFLICT SUCH SEVERE LOSSES THAT IT WILL CONTRIBUTE IN A LARGE MEASURE IN LIMITING THE ACTIVITY OF AN ENEMY.
- e. A WARNING NET...IS NECESSARY FOR PURSUIT TO BE USED IN DEFENSE WITH ANY CONSIDERABLE DEGREE OF EFFICIENCY.
- f. IN RECOGNITION OF THE LIMITATIONS PLACED UPON PURSUIT, PRINCIPALLY DUE TO LIMITED RANGE... EVERY EFFORT SHOULD BE MADE TO DEVELOP PURSUIT AIRPLANES THAT WILL OVERCOME THEM IN ORDER THAT PURSUIT CAN BETTER AID THE AIR FORCE IN THE ACCOMPLISHMENT OF ITS PURPOSE.³⁶

ONE OVERRIDING THEME RESOUNDS IN MCCORMICK'S ANALYSIS: PURSUIT WILL BE EFFECTIVE AGAINST BOMBERS, AND AS A RESULT, BOMBERS NEED ESCORT—A MISSION THE CURRENT US PURSUIT FORCE WAS NOT PREPARED TO ACCOMPLISH.

CAPT A. J. KERWIN MALONE, AN ACTS STUDENT A YEAR LATER, FROM 1938-39, CAME TO SIMILAR CONCLUSIONS IN HIS ACTS THESIS ON THE SINO-JAPANESE WAR. MALONE STUDIED THE EQUIPMENT, PLANES, TACTICS, AND ENGAGEMENTS. IT IS PARTICULARLY NOTEWORTHY THAT HE INCORPORATED THE REPORTS OF AN AMERICAN PILOT FLYING IN THE CONFLICT AS WELL AS REPORTS FROM ITALIAN AND RUSSIAN OBSERVERS.

OVERALL, MALONE NOTED THAT IN THE SINO-JAPANESE WAR, "PURSUIT STILL DOMINATES THE SITUATION," CITING THE ENORMOUS LOSSES SUFFERED BY UNESCORTED JAPANESE BOMBERS. THEY LOST 3 TO 4 BOMBERS TO EACH PURSUIT AIRCRAFT DESTROYED WHEN UNESCORTED. WHEN ESCORTED, "LOSSES WERE REDUCED TO PRACTICALLY NIL AND THE BOMBING WAS MORE ACCURATE AS THE BOMBERS WERE RELIEVED OF THE TASK OF DEFENSE" (EMPHASIS IN ORIGINAL).³⁷ HE NOTED OBSERVATIONS FROM THE AMERICAN PILOT AND A RUSSIAN ATTACHÉ THAT BY TRADING ALTITUDE FOR AIRSPEED WHEN ATTACKING THE BOMBERS, SLOWER FIGHTERS COULD BE EFFECTIVE AGAINST FASTER BOMBERS. THE AMERICAN FURTHER ELABORATED, "ONE BOMBER IN USE HAS AN ESTIMATED SPEED OF 270 MILES BUT THEY GET CAUGHT EVERY SO OFTEN BY PURSUIT WHICH CANNOT BE FASTER THAN 280,

³³ Wing Commander Gade, quoted in McCormick, 31.

³⁴ McCormick, 32.

³⁵ This statement does not track with the rest of McCormick's thesis as he offers proof only to the contrary. His intent may have been to say, pursuit can suffer severe losses and still be effective. His findings continue on to say, "There is no 'cinch' attack. It is believed that pursuit can afford to lose three airplanes to shoot down one heavy bombardment airplane, due to the enormous potential destructive power of the latter and difficulty of rapid replacements."

³⁶ McCormick, 37.

³⁷ Captain A. J. Kerwin Malone, "Pursuit Aviation in the Sino-Japanese War" (Maxwell Field, Ala.: thesis, Air Corps Tactical School, 1938-1939), 19-22 quotes on 19, 22, AFHRA 248.282-28.

AND THE BOMBERS THAT GET CAUGHT SELDOM COME HOME.”³⁸ ADDITIONALLY, THE WAR SHOWED THAT FOR PURSUIT AIRCRAFT TO ESCORT EFFECTIVELY, THEY NEEDED TWO PURSUIT ESCORTS FOR EACH BOMBER. WHEN ESCORTED BY SUFFICIENT NUMBERS, BOMBING RESULTS INCREASED DRAMATICALLY. YET ANOTHER NOTEWORTHY ITEM MALONE HIGHLIGHTS IS THAT THE JAPANESE FIGHTERS WERE EMPLOYING DROPPABLE FUEL TANKS TO ENABLE ESCORT MISSIONS BEYOND 300 MILES FROM THE NEAREST JAPANESE FIELD. FINALLY, THE SINO-JAPANESE WAR INDICATED THAT NIGHT PURSUIT IN COOPERATION WITH SEARCHLIGHTS WAS VERY EFFECTIVE AGAINST JAPANESE BOMBERS.³⁹

FROM THESE RESULTS, MALONE CONCLUDED, AS MCCORMICK HAD A YEAR EARLIER, THAT BOMBARDMENT AGAINST TARGETS DEFENDED BY AIRCRAFT REQUIRED PURSUIT ESCORT. MALONE ALSO OBSERVED THE CRITICAL IMPORTANCE OF GUN EMPLACEMENT ON BOMBERS AND THE NECESSITY OF A TAIL GUNNER. HE ALSO RECOMMENDED EXTENSIVE TESTS ON SEARCHLIGHT COOPERATION WITH NIGHT PURSUIT. FINALLY, HE RECOMMENDED INCORPORATING THE ABILITY TO CARRY EXTERNAL FUEL TANKS ON PURSUIT FIGHTERS. SUCH MODIFICATIONS WOULD REQUIRE INSTALLING RACKS TO CARRY THE TANKS AND PLUMBING TO TRANSFER THE FUEL, BUT WOULD ALSO GIVE THE AIRCRAFT THE ADDED ABILITY TO CARRY SMALL BOMBS.⁴⁰

CLEARLY, BOTH MCCORMICK’S AND MALONE’S THESES EXPANDED PURSUIT AVIATION BEYOND THE DEFENSIVE ROLE. ALTHOUGH THEY PROVIDED VALUABLE INSIGHT INTO PURSUIT EMPLOYMENT, THE AIR CORPS DID NOT INCORPORATE THEIR OBSERVATIONS INTO DOCTRINE. ONE OBVIOUS EXPLANATION WAS THAT US AVIATORS FELT THEIR PLANES AND PILOTS WERE SUPERIOR TO THEIR FOREIGN COUNTERPARTS. THEREFORE, THE LESSONS FROM THEM WERE MOOT. BOTH AUTHORS ADDRESSED THIS FACT DIRECTLY. MALONE ACKNOWLEDGED THE GENERAL CONCLUSION OF MILITARY OBSERVERS THAT THE JAPANESE AND CHINESE WERE FAR BELOW THE STANDARDS OF THE MAJOR POWERS. HOWEVER, MALONE POINTED OUT, “BE THIS AS IT MAY, ONE MUST KEEP IN MIND THAT THE JAPANESE, ESPECIALLY, ARE CONSTANTLY IMPROVING IN ALL RESPECTS AND HAVE THE BENEFIT OF THE BEST SCHOOL IN EXISTENCE, ACTUAL WARFARE, AND THEREFORE MIGHT SURPRISE A POSSIBLE OPPONENT IN THE FUTURE.” MALONE HIGHLIGHTS THE OPINION OF THE AMERICAN PILOT FLYING IN THE FAR EAST THAT THE JAPANESE PURSUIT AIRCRAFT COULD OUTPERFORM CURRENT US FIGHTERS, “THE P-35’S AND P-36’S WILL BE OUTCLASSED SO BADLY THAT SOME SPECIAL USE, SUCH AS ATTACK, WILL HAVE TO BE FOUND FOR THEM.” THE PILOT ALSO WARNED, “JAPANESE GUNNERY IS EXCELLENT” AND “WHATEVER THE GENERAL AVERAGE OF THEIR FLYING ABILITY MAY BE, THE ONES I SEE IN COMBAT ARE GOOD AND DON’T YOU BELIEVE OTHERWISE” (EMPHASIS IN ORIGINAL).⁴¹

ANOTHER POSSIBLE REASON FOR DISMISSING THE OBSERVATIONS IS THAT ACTS, AND THE PURSUIT SECTION IN PARTICULAR, REMAINED FOCUSED ON DEFENSIVE EMPLOYMENT OF PURSUIT AVIATION. AVIATORS STILL CONCENTRATED ON HEMISPHERIC DEFENSE, AND WHILE INSIGHTFUL, THESE THESES DID NOT APPLY TO THE MISSION AIRMEN FORESAW FOR PURSUIT. SPECIFICALLY, THE AIR CORPS BOARD STUDY NO. 35, 7 MAY 1939, NOTED, “OUR PURSUIT OR FIGHTER AIRCRAFT SHOULD BE DESIGNED PRIMARILY FOR THE SUCCESSFUL INTERCEPTION AND DESTRUCTION OF HOSTILE BOMBARDMENT AIRCRAFT OVER OR NEAR FRIENDLY TERRITORY.”⁴² HENCE, AS LATE AS 1939, THE AIR CORPS BELIEVED ITS PURSUIT AIRCRAFT WOULD OPERATE DEFENSIVELY. THIS BELIEF GAVE LITTLE IMPETUS TO DEVELOPING AN ESCORT FIGHTER, REGARDLESS OF THE RESULTS OF FOREIGN EXPERIENCES.

FURTHERMORE, PURSUIT PILOTS STILL HAD NOT SOLVED THE RANGE PROBLEM NECESSARY TO PROVIDE LONG-RANGE ESCORT. THIS PROBLEM LED THE 1939 AIR CORPS BOARD TO CONCLUDE, IN A MANNER SIMILAR TO THE 1935 MULTI-ENGINE FIGHTER AIRCRAFT BOARD:

THERE APPEARS TO BE LITTLE, IF ANY, POSSIBILITY OF EVER BUILDING AN ACCOMPANYING FIGHTER WITH AN OPERATING RANGE COMPARABLE TO THAT OF BOMBARDMENT AND ALSO FIGHTING CHARACTERISTICS, WHICH WOULD ENABLE THEM TO COPE WITH THE ENEMY PURSUIT IN THE VICINITY OF THE BOMBARDMENT OBJECTIVE.... IT IS THE OPINION OF THE AIR CORPS BOARD THAT THE BOMBARDMENT UNITS MUST PLACE THEIR PRINCIPAL RELIANCE FOR SECURITY, IN THEIR HIGH

³⁸ Quoted in Malone, “Pursuit Aviation in the Sino-Japanese War,” 19.

³⁹ Malone, “Pursuit Aviation in the Sino-Japanese War,” 9, 15, 19-23.

⁴⁰ Ibid., 24-25.

⁴¹ Quoted in Malone, 4, 20-21.

⁴² Report of the Air Corps Board, “Study No. 35: Employment of Aircraft in Defense of the Continental United States” (Maxwell Field, Ala., 7 May 1939), Annex IV, 2. AFHRA 167.5-35.

OPERATING SPEED AND THEIR OWN DEFENSIVE ARMAMENT. THERE APPEARS TO BE ROOM FOR CONSIDERABLE IMPROVEMENT IN THE DEFENSIVE ARMAMENT OF BOMBARDMENT AIRPLANES AND THIS MATTER SHOULD RECEIVE CAREFUL STUDY.⁴³

THE RANGE ISSUE ITSELF REPRESENTS A UNIQUE CASE WHERE AVAILABLE TECHNOLOGY AND EMPLOYMENT FAILED TO COME TOGETHER. EXTERNAL FUEL TANKS FOR PURSUIT AIRCRAFT WERE AVAILABLE, HOWEVER AIRMEN FAILED TO RECOGNIZE THAT EXTERNAL FUEL TANKS COULD SOLVE THE RANGE PROBLEM FOR ESCORT. THE REASONS WHY WILL BE EXPLORED IN THE NEXT CHAPTER, BUT IT IS WORTH NOTING THAT A SUBSEQUENT AIR CORPS BOARD IN 1939 STUDIED THE POTENTIAL FOR CARRYING AUXILIARY FUEL TANKS ON PURSUIT FIGHTERS. ONE OF THE CONCLUSIONS OF THAT BOARD WAS THAT "THE STRATEGIC MOBILITY OF SINGLE-ENGINE INTERCEPTOR TYPE PURSUIT AIRCRAFT IS BELOW A SATISFACTORY STANDARD [AND THAT] THE PROVISION OF AN AUXILIARY FUEL TANK... WILL IMPROVE STRATEGIC MOBILITY."⁴⁴ NEVERTHELESS, THE BOARD FAILED TO GRASP THE TACTICAL CAPABILITY THAT EXTERNAL TANKS PROVIDED. NOR WERE THE FINDINGS OF THE BOARD NEW. THE UNITED STATES HAD EXPERIMENTED WITH EXTERNAL FUEL TANKS SINCE WORLD WAR I, WHEN ENGINEERS FITTED A DETACHABLE FUEL TANK TO THE DH-4. IN 1925, THE AIR SERVICE FITTED ITS P-1S WITH A DROPPABLE BELLY TANK TO EXTEND RANGE. THEN IN 1931, THE AIR CORPS ACCEPTED A 52-GALLON AERODYNAMIC TEARDROP-SHAPED BELLY TANK AS THE STANDARD EXTERNAL TANK FOR PURSUIT AIRCRAFT.⁴⁵ NOR DID THE AIR CORPS SIMPLY EXPERIMENT WITH EXTERNAL TANKS IN TESTS. IN 1931, THE AIR CORPS RELIED ON AUXILIARY FUEL TANKS TO GAIN STRATEGIC MOBILITY. THAT YEAR, P-12S, WITH EXTERNAL FUEL TANKS, DEPLOYED FROM SELFRIDGE FIELD, MICHIGAN, TO WASHINGTON, D.C. NEVERTHELESS, STRATEGIC MOBILITY AND EXTENDING THE RANGE OF PURSUIT AIRCRAFT FOR ESCORT DUTIES REMAINED SEPARATE CONCEPTS AND THE AIR CORPS TOOK NO SIGNIFICANT ACTION TOWARDS DEVELOPING EXPENDABLE FUEL TANKS FOR ESCORT RESPONSIBILITIES UNTIL 1942 WHEN THE BOMBERS DETERMINED THEY NEEDED ESCORT FIGHTERS.

Pursuit Instruction within ACTS

ONE REASON THE EXTERNAL TANKS NEVER LATCHED ON TO THE ESCORT MISSION WAS THE FOCUS OF PURSUIT EDUCATION ON DEFENSIVE MISSIONS. ACTS IN PARTICULAR REINFORCED THE DEFENSIVE NATURE OF PURSUIT THROUGH ITS CLASSES. LT COL DONALD WILSON, THE DIRECTOR OF AIR TACTICS AND STRATEGY, CLEARLY LAID OUT THE SCHOOL POLICY FOR PURSUIT AVIATION INSTRUCTION IN A LETTER TO THE ASSISTANT COMMANDANT. HE WROTE, "THE PRIMARY JOB FOR PURSUIT IS TO KEEP THE ENEMY FROM OPERATING UNOPPOSED IN ANY PART OF THE AREA IT IS DESIRED TO PROTECT." PURSUIT MISSIONS IN ORDER OF PRIORITY WERE NATIONAL DEFENSE, HEMISPHERIC DEFENSE, AND PURSUIT DEFENSE. WITHIN THE SUBSECTION OF PURSUIT DEFENSE, WHICH FOCUSED ON MISSIONS TO DEFEND FRIENDLY AIR FORCES, HE ESTABLISHED SECTOR DEFENSE AS THE FIRST PRIORITY FOR PURSUIT AVIATION. HIS SECOND PRIORITY WAS LOCAL OR POINT DEFENSE. AS A THIRD PRIORITY FOR PURSUIT AIRCRAFT, HE LISTED ESCORT AND GROUND ATTACK MISSIONS. HOWEVER, HE STRESSED THAT ESCORT AND GROUND ATTACK MISSIONS WERE LOW PRIORITY AND THAT THEY SHOULD "BE GIVEN EXPERIMENTAL CONSIDERATION ONLY AFTER THE FIRST AND SECOND PRIORITIES ARE COMPLETE." WILSON ALSO ADDRESSED THE TYPE OF FIGHTER THAT THE AIR CORPS SHOULD DEVELOP. HE ARGUED THAT A SINGLE AIRCRAFT OF THE INTERCEPTOR TYPE, WHICH COULD BE EQUIPPED WITH A DROPPABLE AUXILIARY FUEL TANK, COULD ACCOMPLISH BOTH SECTOR AND LOCAL DEFENSE AND THEREFORE IT SHOULD BE THE ONLY FIGHTER IN DEVELOPMENT. HIS ARGUMENT RESTED ON THE VIEW THAT SECTOR DEFENSE WOULD ENTAIL AIRBORNE PATROLS DEMANDING EXTRA FUEL FOR THE INTERCEPTOR AIRCRAFT. BY HAVING AN EXTERNAL FUEL TANK, THE INTERCEPTORS COULD MEET THE REQUIREMENT OF AIRBORNE ALERT WITHOUT SACRIFICING TOO MUCH PERFORMANCE RELATIVE TO THE ENEMY BOMBERS. IN CONTRAST, POINT DEFENSE RELIED UPON GROUND ALERT AND DEMANDED A RAPID CLIMB CAPABILITY FOR THE INTERCEPTORS TO MEET THE BOMBERS BEFORE THEY REACHED THEIR OBJECTIVE. HENCE, THE

⁴³ Air Corps Board, "Study No. 35," Annex III, 5 and Annex IV, 2.

⁴⁴ Report of the Air Corps Board, "Study No. 49: Bomb Carrying Requirements for Pursuit Aviation" (Maxwell Field, Ala.: 5 December 1939), 4, AFHRA 167.5-49.

⁴⁵ Bernard Doylan, *Development of the Long-Range Escort Fighter*, USAF Historical Study 136 (Maxwell AFB, Ala.: USAF Historical Division, Air University, 1955), 40, 44-45.

SAME PLANES NEEDED THE CAPABILITY TO FLY SHORT, MAXIMUM PERFORMANCE MISSIONS WITHOUT ANY EXTERNAL FUEL.⁴⁶

ALTHOUGH HIS VIEWS WERE IN LINE WITH SCHOOL POLICY AND THINKING WITHIN THE AIR CORPS, NOT EVERYONE AT ACTS ACCEPTED THEM. AN ANONYMOUS REBUTTAL, MOST LIKELY WRITTEN BY MAJ JAMES E. PARKER OR CAPT EARL E. PARTRIDGE OF THE ACTS PURSUIT SECTION, REFUTED MANY OF WILSON'S FINDINGS. THE REBUTTAL NOTES:

1. THE PURPOSE OF PURSUIT IS TO DENY FREEDOM OF ACTION TO THE ENEMY AND INSURE FREEDOM FOR OUR OWN AIR FORCES.
2. THE SCHOOL TENDENCY IS TO USE PURSUIT ONLY OVER OUR OWN TERRITORY. THIS IS WRONG. WHILE SOME PURSUIT IS NEEDED AT HOME, THE BULK MUST BE USED IN TACTICALLY OFFENSIVE MISSIONS INTENDED TO DESTROY HOSTILE AIRCRAFT IN THE AIR OR ON THEIR HOME AIRDROMES.
3. THE SCHOOL EVIDENTLY FEELS THAT OUR AIR FORCE WILL NOT ENCOUNTER HOSTILE PURSUIT ON M DAY OPERATIONS. I DO NOT CONCUR. THE EXAMPLES IN SPAIN & CHINA, AS WELL AS DURING THE WORLD WAR, DO NOT BEAR OUT THIS THEORY (EMPHASIS IN ORIGINAL).

THE REBUTTAL DISAGREES AS WELL WITH WILSON'S FINDINGS THAT SECONDARY MISSIONS, SUCH AS ESCORT RECEIVE ONLY EXPERIMENTAL CONSIDERATION. IT NOTES, "THESE TYPES OF EMPLOYMENT MAY BE OF [CONSIDERABLE] IMPORTANCE & PRIORITY."⁴⁷ HENCE, AT LEAST WITHIN THE ACTS INSTRUCTOR CORPS, PURSUIT THEORY HAD EXPANDED BEYOND THE CONFINES OF ITS DEFENSIVE MINDSET. THE PURSUIT SECTION ACTIVELY EMBRACED THE LESSONS OF FOREIGN WARS AND THE INTERNATIONAL SITUATION TO ARRIVE AT REALIZATION THAT THEY HAD A LARGER ROLE TO PLAY THAN SIMPLY DEFENSE.

HOW MUCH TIME THE PURSUIT PILOTS OUTSIDE OF ACTS DEVOTED TO MISSIONS BEYOND DEFENSE IS UNKNOWN. WHAT IS APPARENT, HOWEVER, IS THAT UNIT MISSION TRAINING REMAINED SOLELY ORIENTED TOWARD THE DEFENSIVE. WHEN ACTS SURVEYED ALL THREE AIR CORPS PURSUIT GROUPS IN APRIL OF 1939 AS TO THE TYPES OF MISSIONS THEY TRAINED FOR, ALL THREE GROUPS RESPONDED THAT THEY TRAINED ACCORDANCE WITH THEIR PRIMARY MISSION AS DICTATED BY THE ACTS TEXT. SPECIFICALLY, WHEN ASKED, "HAS ANY WORK BEEN DONE IN SUPPORT OF OR IN COOPERATION WITH OTHER PARTS OF THE AIR FORCE? BOMBARDMENT, ATTACK, RECONNAISSANCE?" THE ANSWER ACROSS THE BOARD WAS "NO."⁴⁸ THEREFORE, WHILE PURSUIT THEORY MAY HAVE BEEN EVOLVING INTO A MORE ROBUST CONCEPT, THE DOCTRINE OPERATIONAL UNITS USED FOR TRAINING REMAINED ENTIRELY DEFENSIVE.

Result of Pursuit's Decline

AS WORLD WAR II ENGULFED EUROPE AND THE PACIFIC, AMERICANS HAD ARGUABLY THE BEST BOMBER IN THE WORLD IN THE B-17. ITS PURSUIT AVIATION, HOWEVER, LAGGED BEHIND. ONE HISTORIAN OF INTERWAR AIRPOWER DOCTRINE NOTED, "THE CURTISS P-40 (WARHAWK), THE STANDARD SERVICE PURSUIT IN 1941, PROVED SUITABLE ONLY IN SECONDARY THEATERS OF ACTION; AS AN INTERCEPTOR, THE P-40 WAS NOT THE EQUAL OF THE RAF SPITFIRE OR GERMAN ME-109."⁴⁹ EVEN AS WAR RAGED OUTSIDE THE UNITED STATES FROM 1939 TO 1941 PURSUIT DEVELOPMENT CONTINUED TO LAG ITS FOREIGN COUNTERPARTS. AMERICAN PURSUIT TRAILED BEHIND IN PART DUE TO MONEY AND TECHNOLOGY, BUT MOSTLY BECAUSE PURSUIT DOCTRINE HAMSTRUNG ITS DEVELOPMENT. FIRST, AMERICAN FIGHTERS WERE DESIGNED TO PROTECT THE UNITED STATES AGAINST A HIGHLY IMPROBABLE AIR ATTACK. SECOND, CURRENT AIR FORCE EMPLOYMENT THEORY HAD NO ROLE FOR PURSUIT IN AN OFFENSIVE ROLE. AS SUCH, PURSUIT AVIATION TOOK SECOND SEAT TO BOMBARDMENT IN

⁴⁶ Lt Col Donald Wilson, memorandum to Colonel Harmon, subject: School Policy with Respect to the Employment of Pursuit Aviation, 1 May 1939, 1-8, AFHRA 248.282-36.

⁴⁷ Memorandum, subject: Rebuttal to Lt Col Wilson's memorandum for Colonel Harmon, 1 May 1939, n.p., AFHRA 248.282-36.

⁴⁸ Capt James E. Parker, Chief of Pursuit Section, ACTS, memorandum, subject: Pursuit Questionnaire, 1939, 18, AFHRA 248.282.

⁴⁹ Greer, 85.

PROCUREMENT, DESIGN AND DOCTRINE DEVELOPMENT.⁵⁰ THE RESULT WAS A CONCEPTUAL SHORTFALL BETWEEN PURSUIT'S POTENTIAL MISSIONS AND THE MISSIONS ENVISIONED BY AMERICAN AVIATORS. PURSUIT DEVELOPMENT SUFFERED AS MUCH FROM THIS CONCEPTUAL SHORTFALL AS IT DID FROM ANYTHING ELSE. THE EFFECTS OF THAT SHORTFALL ARE APPARENT WHEN EXAMINING THE US ARMY AIR FORCES' EXPERIENCES AS IT PREPARED FOR AND ENTERED WORLD WAR II.

⁵⁰ Ibid., 85.

Chapter 4

Preparation for War: 1939 to 1941

FOR A NUMBER OF YEARS THOUGHT HAS BEEN CENTERED PRINCIPALLY UPON BOMBARDMENT. PURSUIT HAS BEEN A SORT OF STEPCHILD... OUR SCHOOLS HAVE PLACED PARTICULAR STRESS UPON BOMBARDMENT AND THERE HAS GROWN UP A GENERAL OPINION THROUGHOUT THE AIR CORPS THAT PURSUIT IS A SORT OF NECESSARY EVIL AND THAT IT IS WITHOUT MUCH VALUE... THE RESULTS OF AERIAL OPERATIONS IN EUROPE HAVE SUDDENLY AND FORCIBLY MADE IT EVIDENT THAT WE MUST MODIFY OUR THOUGHT REGARDING THE VALUE OF PURSUIT AND TAKE STEPS TO DEVELOP IT EQUALLY WITH BOMBARDMENT... IT IS PARTICULARLY IMPORTANT THAT THE SERVICE SCHOOLS LAY EMPHASIS UPON THE VALUE OF PURSUIT AND THE NECESSITY FOR RESTORING IT TO ITS COORDINATE POSITION AMONG COMBAT UNITS

*- COL C. W. RUSSELL
AIR CORPS BOARD REPORT,
27 August 1940*

THE GATHERING WAR CLOUDS IN EUROPE IN THE FALL OF 1938 GALVANIZED PRESIDENT ROOSEVELT AND STARTED SERIOUS PREPARATIONS FOR WAR. IN RESPONSE TO THE MUNICH AGREEMENT, ROOSEVELT BEGAN AN EARNEST EFFORT TO INCREASE THE SIZE OF THE AIR CORPS, DECLARING HIS INTENT TO BUILD 10,000 PLANES PER YEAR. THIS DECLARATION BEGAN A RAPID BUILD-UP OF US AVIATION ASSETS THAT WOULD CONTINUE THROUGH WORLD WAR II. GENERAL ARNOLD, THE CHIEF OF THE AIR CORPS, CALLED ROOSEVELT'S DECLARATION THE "MAGNA CARTA" FOR THE ARMY AIR CORPS.¹ FROM 1939 ONWARD, MONEY WAS NO LONGER THE ISSUE; INSTEAD, THE AIR CORPS STRUGGLED TO MEET THE CHALLENGES OF INCREASING ITS SIZE FIVE-FOLD.

WHILE THE BUILD-UP FOR WAR DOMINATED THE AIR CORPS FROM 1939 TO 1941, PURSUIT DEVELOPMENT CENTERED ON EXAMINING THE EXPERIENCES OF FOREIGN PURSUIT AIRCRAFT IN EUROPE IN LIGHT OF AIR CORPS DOCTRINE. IN THE TWO YEARS BEFORE THE JAPANESE ATTACK ON PEARL HARBOR, THE AIR CORPS HAD THE OPPORTUNITY TO LEARN FROM THE EUROPEANS' EXPERIENCES. IN EUROPE, THE AIR CORPS SAW PURSUIT AVIATION PLAY A VITAL ROLE IN THE OUTCOME OF AIR BATTLES AND AS A RESULT, AMERICAN AIRMEN SLOWLY BEGAN TO REFOCUS THEIR EFFORTS TOWARDS ADVANCING PURSUIT AVIATION. THE RENEWED FOCUS CAUSED PURSUIT AVIATION TO EXPERIENCE A SIGNIFICANT REBOUND IN THE YEARS IMMEDIATELY PRIOR TO WORLD WAR II. IT ROSE IN PROMINENCE IN THE AIR CORPS, BECOMING SECOND ONLY TO BOMBARDMENT IN THE GRAND SCHEME.

The Buildup

AT THE MUNICH CONFERENCE IN SEPTEMBER 1938, HITLER THREATENED WAR IF BRITAIN AND FRANCE DID NOT AGREE TO CEDE PORTIONS OF CZECHOSLOVAKIA TO GERMANY. FACING AN APPARENTLY OVERWHELMING LUFTWAFFE AND FEARING A SECOND WORLD WAR IN TWENTY YEARS, BOTH BRITAIN AND FRANCE AGREED TO HITLER'S DEMANDS AND RECOGNIZED GERMANY'S CLAIMS TO PORTIONS OF CZECHOSLOVAKIA. THE MUNICH CONFERENCE SERVED AS A WAKE UP CALL FOR THE UNITED STATES. ROOSEVELT BELIEVED THAT THE GERMANS HAD BLACKMAILED EUROPE WITH THE THREAT OF AIRPOWER. ROOSEVELT ASTUTELY PERCEIVED THE IMPORTANCE OF AVIATION AND CALLED FOR A MASSIVE BUILD-UP OF US AIR FORCES.² IN NOVEMBER 1938, HE ASKED CONGRESS TO INCREASE

¹ Gen H. H. Arnold, *Global Mission* (1949; reprint, Blue Ridge Summit, Pa: Tab books Inc., 1989), 179.

² Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm 1917-1941* (1955; reprint, Washington, D.C.: Office of Air Force History, 1985), 103 and "The Munich Pact September 29, 1938,"

AIRCRAFT PRODUCTION BY 10,000 AIRCRAFT A YEAR. CONGRESS FOLLOWED THE PRESIDENT'S LEAD IN APRIL OF 1939 AND ENACTED THE FIRST LEGISLATION THAT BEGAN THE PREWAR BUILDUP, INCREASING THE AIRCRAFT AUTHORIZATION OF THE AIR CORPS FROM 2,200 AIRCRAFT TO 5,500 AIRCRAFT. THIS ACTION WAS MERELY THE FIRST IN A SERIES OF FORCE INCREASES FOR THE AIR CORPS LEADING UP TO WORLD WAR II. IN MAY 1940, ROOSEVELT UPPED HIS ANNUAL PRODUCTION REQUEST TO 50,000 AIRCRAFT PER YEAR, WITH THE AIR CORPS TO RECEIVE 36,500.³

THE FIRST WAR PLAN FOR THE AIR, AIR WARS PLANS DIVISION (AWPD)/ 1, DRAFTED BY FOUR AIR CORPS TACTICAL SCHOOL INSTRUCTORS IN AUGUST 1941, CALLED FOR EVEN MORE AIRCRAFT. AWPD/1 FORECAST AN INITIAL WAR FIGHTING COMPLEMENT OF 59,727 AIRCRAFT WITH AN ULTIMATE REQUIREMENT OF 63,467 PLANES.⁴ WHILE THE AIR CORPS DID NOT COME CLOSE TO MEETING THOSE GOALS BEFORE THE ATTACK ON PEARL HARBOR IN DECEMBER 1941, IT STILL STRUGGLED WITH THE RAPID EXPANSION. IN 1941, FOR INSTANCE, THE AIR CORPS RECEIVED 8,723 PLANES COMPARED TO ONLY 1,209 PLANES RECEIVED IN THE LAST HALF OF 1940.⁵ AN EVEN MORE TELLING STATISTIC OF THE AIR CORPS' GROWTH WAS THE NUMBER OF PILOTS IT TRAINED. IN THE SECOND HALF OF 1939, THE AIR CORPS GRADUATED JUST 982 PILOTS. IN 1940, IT GRADUATED 8,125, WHILE IN 1941, 27,531 PILOTS RECEIVED THEIR WINGS, A GROWTH OF OVER 300 PERCENT ANNUALLY.⁶ ONE EFFECT OF THE RAPID EXPANSION WAS THAT EXPERIENCED AIR CORPS PILOTS WERE LITERALLY TOO BUSY TRAINING NEW PILOTS TO CONCENTRATE ON DEVELOPING DOCTRINE AND TACTICS.

ARGUABLY, THE BUILDUP AFFECTED NO PLACE MORE THAN THE AIR CORPS TACTICAL SCHOOL (ACTS). IN LATE 1938, SEEING THE SIGNS OF AN IMPENDING BUILDUP, GEN HENRY H. ARNOLD, CHIEF OF AIR CORPS, REDUCED ACTS FROM NINE MONTHS TO TWELVE WEEKS, ALLOWING MORE OFFICERS TO ATTEND THE SCHOOL, ALBEIT WITH LESS DEPTH. THE SHORTENED COURSE REDUCED ACADEMIC HOURS FROM 712 TO 298, BUT ENABLED 400 OFFICERS TO ATTEND IN FOUR CLASSES FROM 1 JUNE 1939 TO 30 JUNE 1940, A FIVE-FOLD INCREASE OVER THE 76 OFFICERS WHO GRADUATED THE PREVIOUS YEAR.⁷ THE FOLLOWING YEAR, THE AIR CORPS SUSPENDED ACTS ALTOGETHER AS THE NEED FOR EXPERIENCED PILOTS, BOTH STUDENTS AND FACULTY ALIKE, TO FILL LEADERSHIP POSITIONS CONTINUED TO GROW. HISTORIAN ROBERT FINNEY NOTES, "THE OUTBREAK OF WAR IN EUROPE IN 1939 SEALED THE FATE OF THE TACTICAL SCHOOL. REQUIREMENTS FOR OFFICERS IN THE TREMENDOUS EXPANSION PROGRAM WHICH FOLLOWED THAT EVENT WERE FAR TOO GREAT TO PERMIT THE EXPERIENCED, WELL-TRAINED OFFICERS WHO WERE THE FRAMERS OF AIR FORCE CONCEPTS AT THE TACTICAL SCHOOL TO FOLLOW THEIR ACADEMIC PURSUITS."⁸

WITH THE DEMISE OF ACTS, SO WENT THE FERTILE GROUND FOR CONCEIVING CONCEPTS OF PURSUIT OPERATIONS. HOWEVER, THE DEVELOPMENT OF PURSUIT AVIATION DID NOT STOP; INSTEAD, IT TRANSITIONED FROM THE ACADEMIC HALLS OF MAXWELL FIELD TO THE SKIES OF EUROPE. US AIRMEN CONTINUED TO EXAMINE PURSUIT AVIATION BY EXTRACTING LESSONS FROM THE AIR WAR IN EUROPE.

Pursuit's Revival

ON 1 SEPTEMBER 1939, THE GERMAN BLITZKRIEG SWEEPED THROUGH POLAND YIELDING A DECISIVE GERMAN VICTORY. SUBSEQUENT GERMAN VICTORIES IN NORWAY AND FRANCE IN 1940 CAUSED A SHIFT IN UNITED STATES POLICY AND OPERATIONAL CONCEPTS FOR EMPLOYMENT. NO

Yale University, on-line, internet, 9 May 2005, available from <http://www.yale.edu/lawweb/avalon/imt/munich1.htm>.

³ Rebecca Hancock Cameron, *Training to Fly: Military Flight Training 1907-1945* (Washington, D.C.: Air Force History and Museums Program, 1999), 307, 313 and Wesley Frank Craven and James Lea Cate, eds., *The Army Air Force in World War II*, vol. 1, *Plans and Early Operations: January 1939 to August 1942* (Chicago, Ill.: The University of Chicago Press, 1948), 104, 107.

⁴ AWPD/1, "Munitions Requirements of the AAF," 12 August 1941, 2, AFHRA 145.82-1 pt. 2. Document is now declassified.

⁵ Irving Brinton Holley, Jr., *Buying Aircraft: Material Procurement for the Army Air Forces* (Washington, D.C.: Center of Military History, 1989), 555.

⁶ Cameron, *Training to Fly*, 371.

⁷ Robert T. Finney, *History of the Air Corps Tactical School 1920-1940* (1955, reprint Maxwell AFB, Ala.: Air Force History and Museums Program, 1998), 79-80, 130-132.

⁸ *Ibid.*, 81.

LONGER WOULD A DECLARATION OF NEUTRALITY GUARANTEE THE SECURITY OF THE UNITED STATES. WHILE STILL FOCUSED ON DEFENSE OF THE WESTERN HEMISPHERE, US LEADERS RECOGNIZED THAT HEMISPHERIC DEFENSE WOULD BENEFIT MOST FROM THE SURVIVAL OF US ALLIES, PARTICULARLY ENGLAND. AS THE OFFICIAL AIR FORCE WORLD WAR II HISTORIANS NOTE, "AN ALLIED VICTORY WOULD FORESTALL AN AXIS INVASION OF THE AMERICAS AND EVEN BY MERELY PROLONGING ALLIED RESISTANCE THE UNITED STATES WOULD GAIN TIME NEEDED FOR BUILDING ITS DEFENSES."⁹ FOLLOWING THIS SHIFT IN NATIONAL POLICY, THE OUTLOOK OF THE AIR CORPS CHANGED AS WELL. IT BEGAN TO FOCUS ITS MISSION AWAY FROM HEMISPHERIC DEFENSE TOWARDS OPERATIONS OVERSEAS IN THE FAR EAST AND EUROPE. THE BATTLE OF BRITAIN, IN THE SUMMER AND FALL OF 1940, REAFFIRMED THE AIR CORPS STANCE THAT IT WOULD FIGHT OVERSEAS. UNFORTUNATELY, IT TAKES TIME TO CHANGE AN ORGANIZATION. THE AIR CORPS WAS NO DIFFERENT AND IT REMAINED PRIMARILY DEFENSE ORIENTED. AS HISTORIAN THOMAS GREER NOTES, "HEMISPHERIC DEFENSE HAD ALREADY BECOME AN ACTUAL UNDERTAKING; HENCE AIR LEADERS WERE INCLINED TO GEAR THEIR DOCTRINES AND REQUIREMENTS PRIMARILY TO THAT CONSIDERATION."¹⁰ PURSUIT AVIATION IN PARTICULAR, EVEN AFTER THE BATTLE OF BRITAIN, REMAINED FOCUSED ON DEFENSIVE OPERATIONS AS THE BUILDUP FOR WAR CONTINUED.

AWPD/1, PUBLISHED 12 AUGUST 1941, HIGHLIGHTED THE PERVASIVE DEFENSIVE MINDSET FOR PURSUIT EMPLOYMENT IN THE ARMY AIR FORCES (AAF).¹¹ OF THE 54 PURSUIT GROUPS REQUIRED BY AWPD/1, 31 WERE DEDICATED TO DEFENSE OF THE WESTERN HEMISPHERE. THE DEFENSIVE CAST PERVADED EVEN INTO THE OFFENSIVE OPERATIONS FORESEEN AGAINST GERMANY. FOR THE CAMPAIGN AGAINST GERMANY, AWPD/1 DICTATED AN INITIAL REQUIREMENT OF ONLY 16 PURSUIT GROUPS IN THE THEATER. IT PROPOSED STATIONING TEN GROUPS IN ENGLAND AND SIX IN THE MIDDLE EAST AND EASTERN MEDITERRANEAN. AWPD/1 EMPHASIZED THAT THEIR ROLE WAS "DEFENSE OF AMERICAN BASES IN BRITISH ISLES [AND] NEAR EAST." IT ELABORATED FURTHER, "THE PRINCIPAL MISSION OF PURSUIT IS DEFENSIVE; I.E. PROTECTION OF BASES AND VITAL AREAS."¹² WHILE AWPD/1 ARGUED THAT PURSUIT WAS PRIMARILY DEFENSIVE, IT DID NOT OVERLOOK THE NEED FOR ESCORT, BUT ARGUED THAT CURRENT PURSUIT AIRCRAFT WERE INADEQUATE FOR ESCORT MISSIONS.

ONE OF THE LESSONS THE AIR CORPS BEGAN EXTRACT FROM THE WAR IN EUROPE WAS THE VIABILITY OF FIGHTERS VERSUS BOMBERS. AS EARLY AS NOVEMBER 1939, GENERAL ARNOLD CALLED FOR A REASSESSMENT OF PURSUIT AVIATION. HE SPECIFICALLY NOTED, "A DOCTRINE WHICH HAS BEEN WIDELY PROPOUNDED IN CERTAIN AIR CORPS CIRCLES FOR MANY YEARS, TO THE EFFECT THAT PURSUIT AIRCRAFT AND FIGHTER AVIATION CAN BE MINIMIZED ON THE BASIS THAT FIGHTER CRAFT CANNOT SHOOT DOWN LARGE BOMBARDMENT PLANES IN FORMATIONS, HAS NOW BEEN PROVEN WHOLLY UNTENABLE."¹³ MAJ GEN DELOS EMMONS, CHIEF OF THE GHQ AIR FORCE, IN A LETTER TO ARNOLD IN EARLY 1940 EXPANDED ON ARNOLD'S CLAIM, "AERIAL OPERATIONS OF THE PRESENT EUROPEAN CONFLICT CONFIRM THE RESULTS OF THE WORLD WAR; THAT IS THAT THE PRESENT BOMBARDMENT PLANE CANNOT DEFEND ITSELF ADEQUATELY AGAINST PURSUIT ATTACK."¹⁴ THIS VIEW PERVADED BOMBARDMENT LEADERS AND ACTS AS WELL.¹⁵

WHILE THE PROBLEM WAS CLEAR, THE SOLUTION REMAINED OBSCURE. THE RUB? THROUGHOUT THE YEARS, SOME ADVOCATED IMPROVING BOMBARDMENT ARMAMENT AND FORMATIONS, WHILE OTHERS CALLED FOR THE DEVELOPMENT OF DEDICATED ESCORT AIRCRAFT. GEN EARLE E.

⁹ Wesley Frank Craven and James Lea Cate, eds., *The Army Air Force in World War II*, vol. 1, *Plans and Early Operations: January 1939 to August 1942* (Chicago, Ill.: The University of Chicago Press, 1948), 103.

¹⁰ Greer, *The Development of Air Doctrine*, 108.

¹¹ On 20 June 1941, the Air Corps was reorganized as the US Army Air Forces under General Arnold. This paper uses either the Army Air Forces or Air Corps synonymously depending on whether the date in question is before or after 20 June 1941.

¹² AWPD/1, "Munitions," Tab C, 2 and Tab 8, 1.

¹³ Maj Gen H. H. Arnold, memorandum to Commanding General, GHQ Air Force, subject: Pursuit Training and Pursuit Plane and Tactical Development, 14 November 1939, in Report of the Air Corps Board, "Study No. 54: Pursuit Training and Pursuit Plane and Tactical Development" (Maxwell Field, Ala.: 27 August 1940), 2, AFHRA 167.5-54.

¹⁴ Maj Gen Delos Emmons, quoted in Greer, *The Development of Air Doctrine*, 117.

¹⁵ Greer, *The Development of Air Doctrine*, 117.

PARTRIDGE, ACTS PURSUIT INSTRUCTOR FROM 1938-40, NOTED THE DISPARATE VIEWS WITHIN ACTS. PARTRIDGE NOTES:

I GOT A HOLD OF AN OLD FRIEND NAMED SNAVELY (BRIG GEN RALPH A.) [CHIEF OF BOMBARDMENT TRAINING AT ACTS 1937-40] AND SAID, "WELL, HOW MUCH PROTECTION DO YOU THINK YOU'RE GOING TO NEED TO KEEP THE ENEMY FIGHTERS OFF YOUR TAIL WHEN YOU'RE FLYING THOSE BOMBERS?" HE SAID, "ALL I CAN GET." OTHER PEOPLE WERE SAYING, "WE CAN HANDLE THEM WITH OUR FLEXIBLE GUNS FROM THE REAR."¹⁶

AWPD/1 AGREED WITH THE FINDINGS THAT BOMBERS WERE VULNERABLE AND EMPHASIZED THE NEED FOR AN ESCORT FIGHTER. SPECIFICALLY, WITH REGARD TO GERMANY, AWPD/1 NOTED, "INTERCEPTIONS ARE THE RULE, NOT THE EXCEPTION. THE GERMANS ARE NOW KNOWN TO BE USING A RADIO MEANS OF DETECTING AND TRACKING AIRCRAFT. THEY ALSO HAVE A WELL ORGANIZED SYSTEM OF GROUND OBSERVERS."¹⁷ AS A RESULT, PENETRATING HOSTILE DEFENSES REQUIRED THE BOMBERS TO USE SPEED, ALTITUDE, DEFENSIVE FIREPOWER, AND NUMBERS TO EXECUTE SIMULTANEOUS ATTACKS. THE PLAN FURTHER CONCEDED THAT EVEN EMPLOYING ALL THE ABOVE TACTICS, BOMBARDMENT MIGHT STILL REQUIRE FIGHTER ESCORT:

IT HAS NOT YET BEEN DEMONSTRATED THAT THE TECHNICAL IMPROVEMENTS TO THE BOMBARDMENT AIRPLANE ARE OR CAN BE SUFFICIENT TO OVERCOME THE PURSUIT AIRPLANE, PERMITTING DAY OPERATIONS IN THE FACE OF STRONG PURSUIT OPPOSITION.... IT IS ANTICIPATED THAT THE INTERCEPTOR AIRPLANE AND THE EFFECTIVENESS OF ITS FIRE WILL BE FURTHER IMPROVED AND IT IS NOT IMPOSSIBLE THAT THE PRESENT RELATIVE SUPERIORITY OF THE INTERCEPTOR OVER THE BOMBER MAY BE MAINTAINED.¹⁸

THE SOLUTION AWPD/1 PROPOSED WAS THE DEVELOPMENT OF AN ESCORT FIGHTER, "WITH A RANGE COMPARABLE TO THE BOMBER IT SUPPORTS...TO INSURE DAY BOMBING MISSIONS IN SPITE OF OPPOSITION BY THE PURSUIT DEVELOPMENTS EXPECTED IN THE NEAR FUTURE."¹⁹ THE PROPOSED AIRCRAFT THEY ENVISIONED WAS NOT A PURSUIT FIGHTER HOWEVER, BUT A "LARGE, HEAVILY GUNNED LONG-RANGE ESCORT FIGHTER." ITS ROLE WAS NOT TO MANEUVER AGAINST THE ENEMY PURSUIT, BUT TO SHIELD THE FLANKS AND REAR OF THE BOMBER STREAMS. THE ESCORT FIGHTER THEY CONCEIVED WAS A HEAVILY ARMED DEFENSIVE GUNSHIP, ONLY SLIGHTLY FASTER THAN THE BOMBERS IT ESCORTED. AS SUCH, THE ESCORT FIGHTER RECOMMENDED BY AWPD/1 WAS SIMILAR IN CONCEPT TO THE FAILED XFM-1 DEVELOPED IN THE MID 1930s.

AWPD/1, HOWEVER, DID NOT RELY COMPLETELY ON THE DEVELOPMENT OF AN ESCORT FIGHTER TO PROTECT BOMBARDMENT AIRCRAFT. THE PLAN ALSO RECOGNIZED THE CAPABILITY OF CURRENT PURSUIT AIRCRAFT TO PROVIDE SHORT-RANGE ESCORT UNTIL THE AAF DEVELOPED AN ESCORT FIGHTER. IT STATED, "ADDITIONAL [PURSUIT] INTERCEPTORS FOR SHORT RANGE SUPPORT OF BOMBARDMENT SHOULD BE PROVIDED, IF THE ESCORT FIGHTER CAN NOT BE BUILT."²⁰ HENCE, WHILE AWPD/1 REMAINED FOCUSED ON RESTRICTING LIGHT PURSUIT AIRCRAFT TO DEFENSIVE MISSIONS AND DEPENDED UPON BUILDING A HEAVY FIGHTER FOR ESCORT, IN A SENSE, IT ACCURATELY PREDICTED THE USE OF AIRPOWER IN EUROPE. SPECIFICALLY, IT FORESAW THE NEED TO ESCORT BOMBERS AND SOWED THE SEED FOR LIGHT PURSUIT AIRCRAFT TO PROVIDE THAT ESCORT, EVEN IF ONLY FOR SHORT DISTANCES INITIALLY.

WHILE AWPD/1 ACKNOWLEDGED THE POSSIBLE NEED FOR BOMBER ESCORT, THE AUTHORS STILL MAINTAINED THAT THE POTENTIAL FOR UNESCORTED OPERATIONS EXISTED. AWPD/1 ADDRESSED THE UNIQUE ABILITY OF SOME BOMBERS TO OPERATE WITHOUT ESCORT. IT RECOGNIZED THE B-17 AND STERLING BOMBERS ESPECIALLY AS STAND-ALONE PLATFORMS, WHICH COULD SURVIVE WITHOUT ESCORT DUE TO THEIR HIGH SPEED, HEAVY DEFENSIVE ARMAMENT, AND HIGH ALTITUDE CAPABILITY. IT

¹⁶ Gen Earle E. Partridge, transcript of oral history interview by Tom Sturm and Hugh N. Ahmann, 23-25 April 1974, 197, AFHRA K239.0512-729.

¹⁷ AWPD/1, "Munitions," Tab 1, 10.

¹⁸ Ibid., Tab 3, 1-2.

¹⁹ Ibid., 3.

²⁰ Ibid., Tab 8, 5.

NOTES, "THE BRITISH STERLING AND AMERICAN B-17 BOMBERS PROVIDE A MEANS AT LEAST FOR THE MOMENT OF COPING WITH DAY FIGHTERS.... CONSIDERATION OF ALL THESE FACTORS LEADS TO THE CONCLUSION, THAT BY EMPLOYING LARGE NUMBERS OF AIRCRAFT WITH HIGH SPEED, GOOD DEFENSIVE FIRE POWER, AND HIGH ALTITUDE, IT IS FEASIBLE TO MAKE DEEP PENETRATIONS INTO GERMANY IN DAYLIGHT" (EMPHASIS IN ORIGINAL).²¹ THIS CONCEPT, A RELIC FROM THE EARLY 1930S, WHEN THE UNESCORTED BOMBER DOMINATED THE AIR CORPS DOCTRINE, REMAINED ALIVE WITHIN SOME SECTIONS OF THE AIR CORPS UNTIL THE RESULTS OF UNESCORTED RAIDS IN NORTHERN EUROPE PROVED IT UNTENABLE.

A PURSUIT BOARD IN OCTOBER 1941 ADDRESSED THE ASSUMPTIONS OF AWPDP/1 AND ACKNOWLEDGED THE POSSIBILITY THAT HOSTILE PURSUIT COULD INHIBIT UNESCORTED BOMBARDMENT. THE BOARD, THEREFORE, RECOMMENDED DEVELOPING A CONVOY ESCORT SIMILAR TO THE ESCORT FIGHTER DESCRIBED BY AWPDP/1, BUT DOUBTED THE PRACTICAL FEASIBILITY OF PRODUCING SUCH AN AIRCRAFT AS WELL AS ITS EFFECTIVENESS. THE BOARD ASSESSED THAT SUCH AN AIRCRAFT WOULD REDUCE BOMBARDMENT PRODUCTION BY UP TO 25 PERCENT AS THE AAF WOULD USE A BOMBARDMENT AIRFRAME FOR THE ESCORT FIGHTER. AS A RESULT, WHILE THE BOARD RECOGNIZED THE NEED FOR AN ESCORT FIGHTER AS DESCRIBED BY AWPDP/1, IT PLACED THE PRODUCTION OF SUCH AN AIRCRAFT AS THE LOWEST PRIORITY OF SIX PURSUIT AIRCRAFT RECOMMENDED FOR DEVELOPMENT. GIVING THE ESCORT FIGHTER THE LOWEST PRIORITY ENSURED THE AAF WOULD NOT RESEARCH OR DEVELOP IT PROMPTLY.²²

THE LACK OF AN ESCORT FIGHTER NOT ONLY INCREASED THE RISK TO US BOMBARDMENT ENTERING THE WAR, BUT IT ALSO RETARDED THE USE OF PURSUIT AS ESCORT DURING THE WAR. AIR LEADERS ENTERING WORLD WAR II ESTABLISHED A MENTAL PARADIGM FOR THE ESCORT FIGHTER THAT WAS HARD TO BREAK. THEY ENVISIONED THE LONG-RANGE ESCORT AS A LARGE, HEAVILY ARMED CONVOY DEFENDER. THIS CONCEPT LIKELY DELAYED AIR CORPS LEADERS FROM EXPLORING THE OPTION OF EXTENDING THE RANGE OF CURRENT PURSUIT AIRCRAFT TO MEET ESCORT REQUIREMENTS. UNTIL A CONVOY DEFENDER PROVED UNWORKABLE, PROPONENTS WOULD FOCUS ON ITS DEVELOPMENT RATHER THAN EXTENDING THE RANGE OF CURRENT PURSUIT AIRCRAFT. THE RESULT WAS THAT THE UNITED STATES ENTERED WORLD WAR II WITHOUT AN ESCORT AIRCRAFT, A TESTED ESCORT CONCEPT, OR A VIABLE SOLUTION IN THE WORKS.

Pursuit Leadership and Training

THE GROWING REALIZATION OF THE NEED FOR BOMBARDMENT ESCORT WAS INDICATIVE OF A LARGER REVIVAL OF PURSUIT AVIATION WITHIN THE AIR CORPS. THE RECOVERY OF PURSUIT CONTINUED A TREND NOTICEABLE IN THE ACTS CURRICULUM SINCE 1935. COL MILLARD F. HARMON, ACTS ASSISTANT COMMANDANT FROM 1938 TO 1940, WROTE TO THE OFFICE OF THE CHIEF OF THE AIR CORPS IN 1939 INDICATING THE POSITIVE TREND IN PURSUIT ACADEMICS AT ACTS. HE NOTED INCREASED HOURS IN THE SYLLABUS DEVOTED TO PURSUIT AVIATION AND STRESSED THAT PURSUIT RECEIVED GREATER ATTENTION IN THE AIR FORCE COURSE. HE FURTHER HIGHLIGHTED HIS DISLIKE FOR THE DOCTRINE OF "BOMBER INVINCIBILITY" IN FAVOR OF A BALANCED APPROACH BETWEEN COMBAT BRANCHES. "WE ASSIGN PURSUIT A VERY IMPORTANT ROLE," HE WROTE, "SECOND ONLY IN IMPORTANCE TO THE MAIN DEPENDENCE PLACED ON THE STRIKING FORCE."²³ ADDITIONALLY, ALTHOUGH PREDOMINANTLY FOCUSED ON THE DEFENSIVE MISSION OF PURSUIT, THE ACTS SYLLABUS DID SPEND A SMALL FRACTION OF ITS TIME DISCUSSING OTHER MISSIONS. TWO OF THE TWENTY-TWO PURSUIT LECTURES IN THE 1938-39 SYLLABUS STAND OUT IN PARTICULAR: "PURSUIT IN SUPPORT OF AIR FORCE"²⁴ AND "PURSUIT IN SUPPORT OF GROUND FORCES." BOTH LECTURES ADDRESSED MISSIONS OUTSIDE OF THE DEFENSIVE CAST GIVEN PURSUIT. NOTABLY, WHEN ACTS SHORTENED ITS COURSE TO

²¹ AWPDP/1, "Munitions," Tab 1, 11-12.

²² Bernard Boylan, *Development of the Long-Range Escort Fighter*, USAF Historical Study 136 (Maxwell AFB, Ala.: USAF Historical Division, Air University, 1955), 34-36 and William R. Emerson, "Operation POINTBLANK: A Tale of Bombers and Fighters," Harmon Memorial Lecture, United States Air Force Academy, Colo., 27 March 1962, 453.

²³ Col Millard F. Harmon, quoted in Greer, *The Development of Air Doctrine*, 83.

²⁴ This lecture dealt mostly with pursuit in support of bombardment, discussing escort, general, and special support functions.

12 WEEKS, IT COMBINED THE TWO LECTURES TOGETHER INTO A SINGLE LECTURE.²⁵ THUS, ALTHOUGH THE AVIATORS ATTENDING ACTS IN ITS FINAL YEARS RECEIVED PREDOMINANTLY A DEFENSIVE BASED PURSUIT EDUCATION, THEY DID RECEIVE AT LEAST A TASTE OF THE FULL RANGE PURSUIT MISSIONS, EVEN IF ONLY IN AN ACADEMIC ENVIRONMENT.

GENERAL ARNOLD'S CALL FOR RENEWED EMPHASIS ALSO PUSHED THE RECOVERY OF PURSUIT TRAINING BEYOND ACTS BY CALLING FOR AN AIR CORPS BOARD TO INVESTIGATE PURSUIT AVIATION. HE TOLD THE BOARD, "THAT THE SUBJECT OF PURSUIT AVIATION—TACTICS AND PLANE DEVELOPMENT, HAS NOT RECEIVED THE SHARE OF ATTENTION AND INTEREST IN THE AIR CORPS WHICH IT MERITS AND THAT, CONSEQUENTLY, THIS PHASE OF MILITARY AVIATION HAS LAGGED BOMBARDMENT." HE CONTINUED, "REFERENCE TO REPORTS FROM AIR ACTIVITY IN RECENT WARS CLEARLY INDICATES THE NECESSITY FOR PURSUIT AVIATION AND THE VERY GREAT ROLE IT PLAYS IN AIR COMBAT AND ANTI-AIRCRAFT DEFENSE." HIS OBJECTIVE FOR THE BOARD WAS TO SUBMIT A PLAN FOR PURSUIT EQUIPMENT, PERSONNEL AND TRAINING TO MAKE UP FOR THE SHORTCOMINGS OF PURSUIT DEVELOPMENT.²⁶

THE RESULTING AIR CORPS BOARD, "PURSUIT TRAINING AND PURSUIT PLANE AND TACTICAL DEVELOPMENT," AFFIRMED ARNOLD'S INTIMATION THAT PURSUIT DEVELOPMENT HAD LAGGED BEHIND ITS BOMBARDMENT COUNTERPART. HOWEVER, WHILE THE BOARD DID ENCOURAGE SOME EQUIPMENT MODIFICATIONS, OVERALL IT FELT THAT US PURSUIT AIRCRAFT DEVELOPMENT WAS IN LINE WITH THE OTHER MAJOR POWERS, NOTING, "THE CURRENT EXPANSION PROGRAM CONTRACTS SHOULD PRODUCE AIRPLANES EQUAL IN MOST RESPECTS TO THOSE OF OTHER MAJOR POWERS."²⁷ WHERE THE BOARD DID FIND PURSUIT LACKING WAS IN SENIOR LEADERSHIP POSITIONS AND RELEVANT TRAINING.

THE BOARD IDENTIFIED A SERIOUS SHORTFALL IN THE CAREER PROGRESSION OF PURSUIT AVIATORS AS COMPARED TO BOMBARDMENT PILOTS. THE BOARD NOTED, "OLDER PILOTS GENERALLY HAVE PREFERRED TO SERVE IN BOMBARDMENT UNITS WHERE IT IS FELT THERE IS MORE OPPORTUNITY FOR ADVANCEMENT."²⁸ THE BOARD THUS RECOMMENDED CHANGING PERSONNEL PROVISIONS TO ENABLE PILOTS TO REMAIN IN PURSUIT AVIATION "AS LONG AS THEY REMAIN FIT TO FLY PURSUIT EQUIPMENT UNDER COMBAT CONDITIONS." IT ENCOURAGED PROCEDURES TO RECOGNIZE AND REWARD LEADERSHIP QUALITIES IN PURSUIT PILOTS AND TO PROMOTE LONGEVITY IN PURSUIT AVIATION. THE BOARD HOPED TO "INSURE A CONSTANT HIGH LEVEL OF EXPERIENCE IN PURSUIT UNITS, PROVIDE A SUFFICIENT NUMBER OF QUALIFIED SQUADRON AND GROUP COMMANDERS OF APPROPRIATE GRADES, AND PERMIT PROGRESSIVE TRAINING AND CONTINUITY OF THOUGHT."²⁹

ONE OF THE SHORTFALLS CAUSED BY THE LACK OF LONGEVITY IN PURSUIT AVIATION WAS INEFFECTIVE ADVANCED PURSUIT TRAINING. "THE TURNOVER OF PERSONNEL IN [PURSUIT] UNITS HAS BEEN EXCESSIVE AND IT HAS THEREFORE BEEN NECESSARY TO DEVOTE A GREAT AMOUNT OF TIME TO INDIVIDUAL TRAINING. THESE FACTORS UNQUESTIONABLY HAVE RETARDED THE DEVELOPMENT OF PURSUIT DOCTRINE AS WELL AS PREVENTED ADVANCED TACTICAL TRAINING."³⁰ THUS, THE PERSONNEL FLOW OUT OF PURSUIT NOT ONLY HURT TACTICAL THOUGHT WITHIN THE COMMUNITY, BUT IT DETRACTED FROM THEIR TRAINING AS WELL.

THE BOARD FURTHER IDENTIFIED AIR-TO-AIR TRAINING AS A SPECIFIC WEAKNESS FOR PURSUIT AVIATION. IT NOTED, "PURSUIT TRAINING IN THE PAST GENERALLY HAS NOT BEEN DIRECTED TOWARD ITS PRIMARY MISSION OF ATTACKING OTHER AIRCRAFT." THE BOARD NOW FOUND THAT MOST PURSUIT GUNNERY WAS AGAINST GROUND TARGETS AND THAT LITTLE INTERACTION EXISTED BETWEEN BOMBER AND PURSUIT GROUPS. THEREFORE, THE BOARD RECOMMENDED MORE INTERCEPT TRAINING WITH BOMBERS AND AIRCRAFT WARNING SERVICES AND SUGGESTED GIVING INCREASED EMPHASIS TO AERIAL GUNNERY.³¹ WHAT THE BOARD AMPLY POINTED OUT WAS THAT PURSUIT AVIATION HAD NOT ONLY LAGGED BEHIND BOMBARDMENT AVIATION, BUT THAT ITS LAG HAD HAMPERED THE DEVELOPMENT OF

²⁵ ACTS, "Pursuit Aviation – Short Course (4) 1940," Maxwell Field, Ala, 5 April 1940, n.p. AFHRA 248.2809D.

²⁶ Arnold, memorandum 14 November 1939, 2.

²⁷ Air Corps Board, "Study No. 54: Pursuit," 4.

²⁸ Ibid., 7.

²⁹ Ibid., 6.

³⁰ Ibid., 5.

³¹ Ibid., 4, 6.

PURSUIT AVIATION. IN SUM, PURSUIT AVIATION LACKED BOTH EXPERIENCED SENIOR LEADERSHIP AND ADVANCED TRAINING, CRITICAL FACETS TO PURSUIT'S PREPARATION FOR THE WAR.

Assessment of the Buildup

AS NOTED BY THE 1940 AIR CORPS BOARD, PURSUIT AVIATION DURING THE 1930S LAGGED BEHIND ITS BOMBER BRETHREN. THE AIR CORPS RECOGNIZED THIS DEFICIENCY AND TOOK ACTIONS TO REVITALIZE PURSUIT. FUELED BY PURSUIT SUCCESSES AGAINST BOMBERS IN EUROPE, PURSUIT AVIATION ROSE IN ESTEEM WITHIN THE AIR CORPS, WITH RENEWED EMPHASIS ON BOMBARDMENT ESCORT. LARGELY, AVIATORS AGREED THAT AN ESCORT WOULD BE PREFERABLE AND TOOK STEPS TOWARDS BUILDING AN ESCORT FIGHTER. WHILE THEIR ESCORT CONCEPT WOULD PROVE UNWORKABLE, THEY AT LEAST REESTABLISHED THE BASIS FROM WHICH OTHER IDEAS FOR ACCOMPLISHING THE ESCORT MISSION WOULD GROW.

UNFORTUNATELY, THE RESURGENCE OF PURSUIT CAME TOO LATE FOR THE AIR CORPS TO MAKE DRASTIC CHANGES IN PURSUIT DOCTRINE BEFORE WORLD WAR II. THE DOCTRINE AND CONCEPT OF PURSUIT EMPLOYMENT ESTABLISHED IN THE MID-1930S STILL DOMINATED. PURSUIT FULFILLED PRIMARILY A DEFENSIVE ROLE, AND THE EQUIPMENT, TRAINING, AND OPERATIONS REVOLVED AROUND THE DEFENSIVE. THESE DEFENSIVE PREPARATIONS, HOWEVER, WERE NOT AS DAMAGING AS THE MINDSET IT INVOKED. THAT MINDSET LED THE AAF IN WORLD WAR II TO MISINTERPRET PURSUIT'S ROLE IN GAINING AIR SUPERIORITY. DURING WORLD WAR II, PURSUIT HAD TO RELEARN THAT IT WAS A VITAL ELEMENT, IN CONCERT WITH BOMBARDMENT AND ATTACK, IN GAINING AIR SUPERIORITY, RATHER THAN A SUPPLEMENTAL FORCE TO PREVENT THE ENEMY FROM GAINING AIR SUPERIORITY.

Chapter 5

Pursuit Aviation in World War II

WE WERE TO FIND OUT IN THE HARD SCHOOL OF WAR THAT WITHOUT AIR SUPREMACY, OR AS WE NOW SAY, "AIR SUPERIORITY," SEA POWER COULD NO LONGER BE EXERCISED; AND WITHOUT AIR SUPERIORITY, AIRPOWER ITSELF COULD NOT BE EXERCISED...BUT THE OUTSTANDING LESSON OF THE LATE WAR WAS THAT AIR SUPERIORITY IS THE PREREQUISITE TO ALL WAR WINNING OPERATIONS, WHETHER AT SEA, ON LAND, OR IN THE AIR.

- AIR CHIEF MARSHAL ARTHUR TEDDER

AS THE UNITED STATES ENTERED WORLD WAR II, SEVERAL THINGS WERE CLEAR ABOUT PURSUIT AVIATION. FIRST, AMERICA LACKED A VIABLE ESCORT FIGHTER. FURTHERMORE, WITHIN THE AIR CORPS, DISAGREEMENT STILL EXISTED AS TO THE TYPE OF ESCORT FIGHTER REQUIRED AND EVEN IF ONE WAS NECESSARY. SECOND, PURSUIT DEFINED ITSELF BY ITS DEFENSIVE MISSION. PURSUIT AVIATORS FOCUSED THEIR TRAINING AND DOCTRINE ON INTERCEPTING AND DEFEATING AIR ATTACKS. FINALLY, IN BOTH LEADERSHIP AND TRAINING, PURSUIT HAD FALLEN BEHIND BOMBARDMENT. THAT IS NOT TO SAY THAT PURSUIT WAS WHOLLY UNPREPARED FOR WORLD WAR II. SINCE 1939, PURSUIT HAD RECOVERED SOME OF ITS LOST STATURE AS AIRMEN RECOGNIZED ITS IMPORTANCE TO THE AIR FIGHT. THUS, PURSUIT AVIATION ENTERED WORLD WAR II WITH AT LEAST THE REQUIRED STRUCTURAL BASIS FROM WHICH TO GROW. ONLY THE ACTUAL PERFORMANCE OF PURSUIT IN WORLD WAR II WOULD DETERMINE IF THAT BASIS WAS SUFFICIENT AND IF PURSUIT AVIATION WAS ADEQUATELY PREPARED FOR WORLD WAR II.

THIS CHAPTER ANALYZES THREE CAMPAIGNS THAT EXAMINE PURSUIT AVIATION AT THE BEGINNING OF WORLD WAR II: THE PHILIPPINES, NORTH AFRICA, AND THE STRATEGIC BOMBING CAMPAIGN AGAINST GERMANY. IN EACH OF THE CASES, PURSUIT PILOTS PERFORMED A MARKEDLY DIFFERENT ROLE. IN THE PHILIPPINES, PURSUIT PILOTS DEFENDED THE ISLANDS AGAINST JAPANESE AERIAL BOMBARDMENT, A ROLE VERY MUCH IN LINE WITH AIR CORPS THINKING DURING THE 1930s. IN NORTH AFRICA, PURSUIT PILOTS FOUGHT A BATTLE FOR AIR SUPERIORITY OVER GROUND TROOPS, OPERATING IN SUPPORT OF THE GROUND FORCES IN A MODE SIMILAR TO THE BATTLES OF WORLD WAR I. FINALLY, IN THE CAMPAIGN AGAINST GERMANY, PURSUIT PILOTS PRIMARILY ESCORTED HEAVY BOMBERS OVER THE EUROPEAN CONTINENT. BECAUSE EACH OF THE CAMPAIGNS HIGHLIGHTS A DIFFERENT PURSUIT MISSION, ANALYZING ALL THREE IS NECESSARY TO BUILD A COMPLETE PICTURE OF AMERICAN PURSUIT PERFORMANCE IN THE INITIAL STAGES OF WORLD WAR II.

Philippines

ON 8 DECEMBER 1941 AT 1235 LOCAL,¹ APPROXIMATELY TEN HOURS AFTER THE ATTACKS ON PEARL HARBOR, JAPANESE AIRCRAFT HAMMERED THE FAR EAST AIR FORCES (FEAF) UNDER THE COMMAND OF MAJ GEN LEWIS H. BRERETON. THE JAPANESE QUICKLY DELIVERED DECISIVE BLOWS TO BOTH CLARK AND IBA AIRFIELDS ON THE PHILIPPINES. TO THE JAPANESE PILOTS' SURPRISE, AT CLARK THEY FOUND TWO SQUADRONS OF B-17s AND ONE SQUADRON OF P-40s ON THE GROUND. THEIR BOMBS AND SUBSEQUENT STRAFING ATTACKS DESTROYED 12 OF THE 17 B-17s, 20 OF THE 23 P-40s, AND SEVERELY DAMAGED THE REST OF THE B-17s. AT IBA, THE JAPANESE DESTROYED SEVEN P-40s ON THE GROUND, DECIMATED THE ONLY OPERATING AIR DEFENSE RADAR SITE IN THE PHILIPPINES, AND RENDERED THE FIELD UNUSABLE. IN THE PROCESS, THE JAPANESE SHOT DOWN SIX P-40s, REDUCING BRERETON'S FRONTLINE FORCES TO 58 P-40s AND 18 B-17s. BRERETON HAD STATIONED THOSE

¹ All dates and time refer to the local date and time in the Philippines. The Philippines lie west of the international dateline, hence both Pearl Harbor and the attacks on the Philippines occurred on the same day, 8 December 1941 in the Philippines.

SURVIVING B-17S WELL SOUTH ON THE PHILIPPINE ISLAND OF MINDANAO ONLY DAYS BEFORE THE ATTACK.² WITH THE ONLY OPERATIONAL RADAR STATION DESTROYED, THE FFAF HAD LITTLE TO NO WARNING OF SUBSEQUENT JAPANESE ATTACKS. SO SEVERE WERE THE FOLLOW-ON ATTACKS AND AIRCRAFT ATTRITION THAT AFTER ONLY THREE DAYS OF FIGHTING, BRERETON HAD LOST 70 PERCENT OF HIS PURSUIT FORCE. IN RESPONSE TO THE LOSSES, ON 16 DECEMBER, BRERETON WITHDREW FFAF'S REMAINING B-17S TO AUSTRALIA AND RESTRICTED ITS FEW REMAINING P-40S TO OBSERVATION MISSIONS.³ WITH BRERETON'S ACTIONS, THE FFAF YIELDED COMPLETE AIR SUPERIORITY TO THE JAPANESE. FROM THAT POINT ON, AMERICAN AIRMEN COULD ONLY TRY TO FRUSTRATE THE JAPANESE INVASION, NOT FIGHT FOR CONTROL OF THE AIR.

SEEMINGLY, THE JAPANESE SUCCESS IN THE AIR WAS DUE TO THEIR SURPRISE AND OVERWHELMING NUMBERS. GEN H. H. ARNOLD, AS COMMANDER OF THE ARMY AIR FORCES (AAF), QUOTES A CABLE HE RECEIVED FROM GENERAL MACARTHUR, THE COMMANDER OF THE PHILIPPINE FORCES. "THEIR LOSSES WERE DUE ENTIRELY TO THE OVERWHELMING AIR SUPERIORITY OF THE ENEMY FORCE. THEY HAVE BEEN HOPELESSLY OUTNUMBERED FROM THE START, BUT NO UNIT COULD HAVE DONE BETTER."⁴ ARNOLD, HOWEVER, QUESTIONED THE EMPLOYMENT IN THE PHILIPPINES. HE NOTES, "IT IS TRUE THAT WE WERE SURPRISED AND OUTNUMBERED, BUT I HAD ALWAYS BELIEVED THAT OUR AIRMEN WOULD FIGHT IT OUT IN THE AIR; THEY SHOULD NEVER HAVE BEEN CAUGHT FLAT-FOOTED ON THE GROUND."⁵ ARNOLD'S COMMENTARY INEXORABLY IMPLICATES THE COMMANDERS AND PURSUIT PILOTS CHARGED WITH DEFENDING THE ISLANDS. MOREOVER, DURING THE FOLLOWING FIVE MONTHS, FROM DECEMBER 1941 TO APRIL 1942, US PURSUIT PILOTS OPERATING FROM THE PHILIPPINES FAILED TO INTERCEPT A SINGLE JAPANESE BOMBER OR FIGHTER RAID.⁶ THAT PURSUIT IN THE PHILIPPINES FAILED TO STOP THE JAPANESE ATTACKS IS APPARENT, IDENTIFYING THE REASON WHY, HOWEVER, IS MORE INSIGHTFUL. WAS THE FAILURE OF PURSUIT IN THE PHILIPPINES SIMPLY A MATTER OF THE JAPANESE OUTNUMBERING AND SURPRISING THE AMERICANS OR DID IT RESULT FROM A LACK OF OR MISGUIDED DEVELOPMENT IN THE INTERWAR YEARS?

Failure of Pursuit in the Philippines

ALTHOUGH ARNOLD ATTRIBUTED SOME OF PURSUIT'S SHORTCOMING TO SURPRISE, IN FACT SURPRISE PLAYED ONLY A SMALL ROLE IN THE PHILIPPINES. THE FFAF WERE SURPRISED NEITHER STRATEGICALLY, NOR TACTICALLY ON 8 DECEMBER 1941. IN 1940, MACARTHUR HAD FORECAST THE CONFLICT WITH THE JAPANESE. HE WARNED THAT THE JAPANESE WOULD ATTACK, AND ESTIMATED 1 APRIL 1942 AS THE DATE AFTER WHICH THE JAPANESE WOULD ATTACK.⁷ ADDITIONAL WARNING CAME ON 28 NOVEMBER 1941 WHEN THE WAR DEPARTMENT ALERTED MACARTHUR AND THE REST OF THE PHILIPPINE FORCES THAT NEGOTIATIONS WITH JAPAN HAD FAILED AND ORDERED THEM TO PREPARE FOR HOSTILITIES WITH JAPAN.⁸ IN RESPONSE, BRERETON INITIATED A 24-HOUR ALERT FOR HIS BOMBARDMENT AND FIGHTER FORCES, A STATUS MAINTAINED UNTIL THE JAPANESE ATTACKED.⁹ FURTHERMORE, ON 8 DECEMBER, THE FFAF RECEIVED WORD OF THE ATTACKS ON PEARL HARBOR WELL IN ADVANCE OF THE AERIAL BOMBARDMENT OF THE PHILIPPINES. BY 0445, THE 24TH PURSUIT GROUP (PG) IN THE PHILIPPINES HAD OFFICIAL NOTIFICATION OF THE ATTACKS ON PEARL HARBOR. THE

² Roger G. Miller, "A 'Pretty Damn Able Commander' – Lewis Hyde Brereton: Part II," *Air Power History* 48, no. 1 (Spring 2001): 32 and William H. Bartsch, *Doomed at the Start: American Pursuit Pilots in the Philippines, 1941-1942* (College Station, Tex.: Texas A&M University Press, 1992), 121.

³ Lt Gen Lewis H. Brereton, *The Brereton Diaries: The War in the Pacific, Middle East and Europe, 3 October 1941 – 8 May 1945* (New York, N.Y.: William Morrow and Company, 1946), 55-56 and Bartsch, 122, 153.

⁴ Gen George C. MacArthur quoted in Gen H. H. Arnold, *Global Mission* (1949; reprint, Blue Ridge Summit, Pa: Tab books Inc., 1989), 272.

⁵ Arnold, *Global Mission*, 273.

⁶ Bartsch, *Doomed at the Start*, 427.

⁷ Brereton, *Brereton Diaries*, 19.

⁸ Wesley Frank Craven and James Lea Cate, eds., *The Army Air Force in World War II*, vol. 1, *Plans and Early Operations: January 1939 to August 1942* (Chicago, Ill.: The University of Chicago Press, 1948), 190.

⁹ Brereton, *Brereton Diaries*, 31.

24TH PG, THE ONLY PURSUIT GROUP ON THE ISLANDS, CONSISTED OF THREE P-40E SQUADRONS, ONE P-40B SQUADRON, AND ONE OUTDATED P-35A SQUADRON. EACH SQUADRON HAD ABOUT 18 AIRCRAFT WITH MOST OF THEM OPERATIONAL ON 8 DECEMBER. SUPPLEMENTING THE 24TH PURSUIT GROUP WAS A SQUADRON OF 12 OBSOLETE PHILIPPINE AIR FORCE P-26AS. THE 24TH PG SAT AT THE HIGHEST STATE OF ALERT ON FOUR AIRFIELDS ON THE MORNING OF 8 DECEMBER WITH ITS PILOTS WAITING AT THEIR PLANES.¹⁰

TACTICALLY, THE ATTACKS OF THE JAPANESE DID NOT SURPRISE THE PILOTS OF THE 24TH PG EITHER. *THE RADAR AT IBA PROVIDED AMPLE WARNING OF THE IMPENDING ATTACKS ON 8 DECEMBER.* IN THE NIGHTS PRIOR TO THE JAPANESE ATTACK, THE RADAR AT IBA HAD PROVEN ITS ABILITY TO TRACK ACCURATELY SEVERAL JAPANESE RECONNAISSANCE MISSIONS OVER THE ISLAND OF LUZON. ON THE MORNING OF 8 DECEMBER, THE RADAR SITE PROVED ITS WORTH AGAIN. THE SITE IDENTIFIED AND TRACKED THE FIRST TWO WAVES OF BOMBERS TO HIT THE PHILIPPINES. ALTHOUGH THE FIRST WAVE CONSISTED OF ONLY SHORT-RANGE JAPANESE ARMY PLANES THAT BOMBED THE NORTHERN PART OF LUZON, TWO SQUADRONS OF THE 24TH PG, AIDED BY THE RADAR, MANAGED TO INTERCEPT THE BOMBERS SUCCESSFULLY. UNFORTUNATELY, THE BOMBERS TURNED NORTH AND STARTED THEIR EGRESS AS THE PILOTS OF THE 20TH PURSUIT SQUADRON MADE CONTACT WITH THE ENEMY. ALTHOUGH THE 20TH DID NOT GET CLOSE ENOUGH TO ATTACK THE BOMBERS, TACTICAL WARNING FROM THE RADAR AT IBA HAD ENABLED A SUCCESSFUL INTERCEPT AND PROVIDED A TIMELY SCRAMBLE FOR SURVIVAL OF THE B-17S BASED AT CLARK FIELD.¹¹

DURING THE SECOND WAVE, PURSUIT PILOTS ONCE AGAIN HAD TACTICAL WARNING, BUT THEY FAILED TO INTERCEPT THE JAPANESE BOMBERS. FIVE FACTORS STAND OUT AS POTENTIAL REASONS FOR THE FAILURE OF PURSUIT TO STOP THE JAPANESE ATTACK. THEY ARE PLANNING, TRAINING, EQUIPMENT, TIMING, AND EMPLOYMENT.

Factors Influencing Philippine Pursuit

ONE CANNOT FAULT THE OVERALL GAME PLAN TO DEFEND THE PHILIPPINES FOR OVERLOOKING PURSUIT AVIATION'S CONTRIBUTION, AS COL HAROLD H. "PURSUIT" GEORGE BUILT THE DEFENSIVE PLAN FOR THE PHILIPPINES.¹² CHIEF OF STAFF UNDER BRIG GEN HENRY B. CLAGGET AND MAJ GEN BRERETON, GEORGE WAS THE FOCAL POINT FOR AIR PLANNING AND BRERETON'S "PURSUIT SPECIALIST."¹³ GEORGE, A CAREER PURSUIT PILOT AND ACTS STUDENT FROM 1936-37, WAS A FIRM BELIEVER IN THE EFFICACY OF PURSUIT VERSUS BOMBER AIRCRAFT. REFERRING TO THE BOMBER VERSUS FIGHTER DEBATE, CHENNault HAILED GEORGE AS "AMONG THE MOST VALIANT CHAMPIONS OF OUR CAUSE."¹⁴ GEORGE PLANNED TO USE PURSUIT IN A DEFENSIVE ROLE TO PROTECT THE FFAF'S MAIN STRIKE FORCE, ITS HEAVY BOMBER GROUPS, WHILE THEY WERE ON THE GROUND. THE DRAWBACK TO GEORGE'S PLAN WAS THE NEED TO BUILDUP THE PURSUIT FORCES RAPIDLY. AS CHANCE WOULD HAVE IT, THE JAPANESE ATTACKED IN THE MIDDLE OF THE LARGE EXPANSION. WHEN THE JAPANESE ATTACKED, THE FFAF HAD ONLY 90 FIGHTERS AND 35 BOMBERS, YET THE FFAF EXPECTED ITS FORCE TO DOUBLE WITHIN A FEW WEEKS. BY THE END OF DECEMBER 1941, THE FFAF EXPECTED TO HAVE 240 P-40ES AND AN ADDITIONAL 52 A-24 DIVE-BOMBERS.¹⁵ FURTHERMORE, BY THE END OF FEBRUARY 1942, IT EXPECTED ITS B-17 FORCE TO GROW TO 165 AIRCRAFT.¹⁶

¹⁰ Walter D. Edmonds, *They Fought with What They Had* (1951; reprint, Washington, D.C.: Center for Air Force History, 1992), 70, 75-78.

¹¹ Bartsch, 443-444 and Edmonds, 73-93.

¹² Colonel George wrote the ACTS thesis mentioned in Chapter 3 stressing the need to develop an interceptor with a large cannon to defend against bombers.

¹³ Miller, 25 and Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York, N.Y.: Random House, 1993), 70.

¹⁴ Claire Lee Chennault, *Way of a Fighter* (1949, reprint Tucson, Ariz.: James Thorvardson & Sons, 1991), 27.

¹⁵ Note: AWP/1 called for 260 pursuit aircraft and 272 B-17s or B-24s to defend the Philippines. AWP/1, "Munitions Requirements of the AAF," 12 August 1941, Tab C, 2 and Tab 7, 2, AFHRA 145.82-1 pt. 2. Document is now declassified.

¹⁶ Craven and Cate, *Plans and Early Operations*, 179 and Bartsch, 4.

IN AND OF ITSELF, THE PLAN TO DEFEND THE PHILIPPINES WAS IN ACCORDANCE WITH AIR CORPS DOCTRINE, BUT THE RAPID EXPANSION IT REQUIRED DIRECTLY HAMPERED READINESS. THE BUILDUP DETRACTED FROM THE TRAINING AND COMBAT READINESS OF THE FORCES, BECAUSE EFFORTS TO BUILD THE 24TH PG AND THE FIFTH INTERCEPTOR COMMAND FOCUSED EFFORTS TOWARDS LOGISTICS AND SUPPLY RATHER THAN TOWARDS TRAINING. TIME WAS NOT ON THE SIDE OF THE AMERICAN PURSUIT PILOTS AND THEIR TRAINING SUFFERED BECAUSE OF IT.¹⁷

THE MOST SERIOUS SHORTFALL WAS A LACK OF INTERCEPTION TRAINING. RED SHEPPARD, A PILOT WITH THE 17TH PURSUIT SQUADRON NOTED, "THE SQUADRON HAD NOT SPENT ANY SIGNIFICANT TIME IN DEVELOPING COMBAT TACTICS." IT HAD PRACTICED "MOCK DOGFIGHTING, LOW FLYING, ACROBATICS, AND CLOSE FORMATION FLYING—BUT HAD NOT ONCE PRACTICED INTERCEPTS AGAINST REAL OR SIMULATED BOMBERS WITH OR WITHOUT ESCORTS, [OUR] MAIN TACTICAL RESPONSIBILITY." AFTER TRANSITIONING TO THE P-40E IN NOVEMBER, THE SQUADRON SPENT THE MONTH TRYING "TO LEARN TO HANDLE THEIR DIFFICULT STEED, THEN LEARNING TO FLY THEM IN FORMATION."¹⁸ HIS COMMENTS REFLECT THE GENERAL SITUATION ACROSS THE PHILIPPINES. THE BUILD-UP OF PURSUIT SQUADRONS HAPPENED TOO LATE FOR THE PILOTS TO EFFECTIVELY TRAIN FOR COMBAT. FOR INSTANCE, THE 34TH PS STATIONED AT DEL CARMEN DID NOT RECEIVE THEIR P-35As UNTIL 26 NOVEMBER, LESS THAN TWO WEEKS BEFORE THE JAPANESE ATTACK. PREVIOUSLY TRAINED ON THE P-40, THEY HAD NEVER FLOWN P-35S BEFORE.¹⁹ THE 21ST PURSUIT SQUADRON SUFFERED WORSE. LT COL WILLIAM E. DYESS, THE 21ST COMMANDER NOTES:

ON THE DAY THE JAPS ATTACKED, OUR SQUADRON WAS GIVEN FOUR NEW P-40Es AND I REALLY MEAN NEW. NONE OF THEM EVER HAD BEEN IN THE AIR. THE GUN BARRELS STILL WERE PACKED WITH COSMOLENE (HEAVY GREASE).... AT 2:30 A.M. OF DECEMBER 8 – WITH MUCH WORK STILL TO BE DONE – WE WERE ORDERED TO STATIONS FOR THE SIXTH SUCCESSIVE DAY. NONE OF THE EIGHTEEN PLANES WAITING ON THE LINE HAD BEEN IN THE AIR MORE THAN THREE HOURS.²⁰

BRERETON NOTED THE OUTCOME, "PILOTS WHO HAD NEVER BEEN CHECKED OUT IN P-40s TOOK OFF IN THEM TO GET A CRACK AT THE JAPS."²¹ THE 24TH PURSUIT GROUP SIMPLY LACKED SUFFICIENT TIME TO TRAIN ITS PILOTS. AS A RESULT, WHEN THE JAPANESE ATTACKED, THE GROUP'S PILOTS BARELY KNEW HOW TO FLY THEIR AIRCRAFT, LET ALONE EMPLOY THEM.

ANOTHER TRAINING SHORTFALL WAS IN P-40 GUN EMPLOYMENT. THE GROUP LACKED SUFFICIENT .50-CALIBER AMMUNITION TO ALLOW THEIR PILOTS TO TEST THEIR GUNS OR TRAIN WITH THEM. INSTEAD, THEY PRACTICED AERIAL GUNNERY AGAINST GROUND TARGETS WITH THE .30-CALIBER GUNS IN THE GROUP'S P-35As. THE EFFECT WAS TWO-FOLD. FIRST, THE PILOTS DID NOT KNOW WHAT TO EXPECT WHEN FIRING THEIR GUNS IN THE NEW AIRCRAFT, AND MORE IMPORTANTLY, THEIR GUNS REMAINED UNTESTED PRIOR TO COMBAT. THIS PROVED CRITICAL BECAUSE INSTALLATION ORDERS FROM THE MATERIAL DIVISION AT WRIGHT FIELD DIRECTED DEACTIVATING THE GUNS' CHARGING SYSTEMS BY PLUGGING THE HYDRAULIC LINES. THIS DIRECTIVE FORCED PILOTS TO CHARGE THEIR GUNS ON THE GROUND AND GAVE THEM NO ABILITY TO CHARGE OR CLEAR JAMMED GUNS WHILE AIRBORNE. EVENTUALLY, THE GROUP REMOVED THE HYDRAULIC PLUGS THAT DEACTIVATED THE CHARGING SYSTEMS, BUT NOT BEFORE MANY PILOTS FOUND THEMSELVES IN COMBAT WITH LESS THAN ALL SIX OF THEIR GUNS OPERATING.²² A PARTICULARLY ACUTE EXAMPLE INVOLVED LIEUTENANTS FRED ROBERTS AND WILLIAM POWELL. ON 8 DECEMBER, THE TWO ATTEMPTED TO ENGAGE A GROUP OF JAPANESE ZEROS STRAFING CLARK. ROBERTS FOUND ONLY ONE OF HIS GUNS WORKING AND POWELL NONE.²³ IF THE ROUNDS AND TIME HAD BEEN AVAILABLE TO TEST THE GUNS OF THE P-40s, MOST LIKELY THE GROUP WOULD HAVE NOTED THE CHARGING DEFICIENCIES AND REMOVED THE HYDRAULIC PLUGS ENABLING ITS

¹⁷ Bartsch, 430.

¹⁸ 1Lt William A. Sheppard, quoted in Bartsch, 43.

¹⁹ Bartsch, 32.

²⁰ Lt Col Wm. E. Dyess, *The Dyess Story: The Eye-Witness Account of the Death March from Bataan and the Narrative of Experiences in Japanese Prison Camps and of Eventual Escape* (New York, N.Y.: G. P. Putnam's Sons, 1944), 29.

²¹ Brereton, 46.

²² Edmonds, 139-140 and Bartsch 44.

²³ Bartsch, 81-82.

PILOTS TO CHARGE THEIR GUNS WHILE AIRBORNE BEFORE ENTERING COMBAT. INSTEAD, AMERICAN PILOTS TOOK TO THE SKIES TO MEET THE JAPANESE WITH LESS THAN FULLY FUNCTIONAL EQUIPMENT.

THE GUNS AND AMMUNITION WERE NOT THE ONLY EQUIPMENT SHORTFALLS. LACK OF ADEQUATE OXYGEN EQUIPMENT WAS ANOTHER SIGNIFICANT PROBLEM. ON 8 DECEMBER, THREE OF THE FIVE PURSUIT SQUADRONS FLEW WITHOUT OXYGEN. THE LACK OF OXYGEN RESULTED FROM HAVING TOO LITTLE ON HAND AS WELL AS NOT HAVING TRANSFER CARTS TO CONVERT STORED HIGH-PRESSURE OXYGEN INTO LOW-PRESSURE OXYGEN USABLE BY THE FIGHTERS. THE RESULT WAS TO LIMIT THE MAXIMUM ALTITUDE OF THREE-FIFTHS OF THE 24TH PG TO APPROXIMATELY 18,000 FEET. EVEN WITH EVERYTHING ELSE GOING PERFECTLY, THREE-FIFTHS OF THE GROUP WOULD HAVE BEEN INEFFECTIVE AGAINST THE JAPANESE BOMBERS WHO FLEW WELL ABOVE THE ALTITUDE AMERICAN PILOTS COULD FLY WITHOUT OXYGEN.²⁴

AN EVEN LARGER DRAWBACK THAN THE LACK OF OXYGEN WAS THE HIGH ALTITUDE PERFORMANCE OF THE P-40S. THE P-40BS AND P-40ES EMPLOYED BY THE 24TH PURSUIT GROUP HAD NEITHER A TURBOCHARGER NOR A SUPERCHARGER TO KEEP THEIR ENGINES FROM LOSING POWER AT ALTITUDE DUE TO THINNER AIR. HENCE, AS THEY CLIMBED THEIR PERFORMANCE DROPPED OFF RAPIDLY.²⁵ WHILE THEIR ENGINES PERFORMED WELL AT LOW ALTITUDES, AT THE CRITICAL ALTITUDES REQUIRED FOR INTERCEPTING BOMBERS, THEIR ENGINES LACKED THE NECESSARY PERFORMANCE. IN THIS REGARD, THE P-40 LAGGED BEHIND THE BRITISH, GERMAN, AND JAPANESE FIGHTERS. THE PILOTS OF THE 20TH PURSUIT SQUADRON GOT A CLEAR DEMONSTRATION OF THIS IN EARLY NOVEMBER. FOR PRACTICE, THEY INTERCEPTED A FLIGHT A B-17S AT 25,000 FEET, BUT AFTER INTERCEPTING THE BOMBERS, THEY COULD NOT KEEP UP WITH THE LARGE BOMBER IN LEVEL FLIGHT.²⁶ WHETHER THE P-40S WOULD HAVE BEEN MORE EFFECTIVE AGAINST THE JAPANESE BOMBERS IS DEBATABLE, BUT ON 8 DECEMBER, WHEN P-40S TRIED TO CLIMB TO MEET JAPANESE BOMBERS OVERHEAD, THEY FAILED. THEIR CLIMB RATE WAS TOO SLOW TO REACH THE BOMBERS' ALTITUDE IN TIME TO MAKE AN EFFECTIVE INTERCEPT.²⁷

THE OTHER SIGNIFICANT DRAWBACK TO THE P-40 WAS ITS POOR PERFORMANCE IN A DOGFIGHT. EVEN AT LOW ALTITUDE, THE JAPANESE ZERO, ITS PRIME ADVERSARY, TURNED QUICKER AND COULD OUT CLIMB THE P-40. HOWEVER, THE P-40'S HEAVY WEIGHT AND SMOOTH AERODYNAMIC DESIGN DID ENABLE IT TO OUT DIVE AND OUT RUN THE ZERO. ADDING TO THE P-40 PERFORMANCE LIMITATIONS WAS THE INEXPERIENCE OF THE AMERICAN PILOTS. THE PILOTS OF THE 24TH PURSUIT GROUP DID NOT KNOW THE ZERO'S CAPABILITIES AND WERE SURPRISED TO FIND JAPANESE FIGHTERS ESCORTING THEIR BOMBERS GIVEN THE SIGNIFICANT DISTANCE FROM THE JAPANESE FIELDS ON FORMOSA TO THE PHILIPPINES. TO GET THE REQUIRED RANGE FOR ESCORT DUTIES THE JAPANESE USED DROPPABLE FUEL TANKS, A CAPABILITY NOTED IN REPORTS BUT NOT READILY APPARENT TO THE US PURSUIT PILOTS.²⁸ AS A RESULT, THE PURSUIT PILOTS HAD TO DISCOVER THE STRENGTHS AND WEAKNESSES OF THE ZERO IN COMBAT. THIS PLACED THE AMERICAN PURSUIT PILOTS AT A GREAT DISADVANTAGE IN THE FIRST FEW DAYS OF THE CONFLICT, AS THEY INFLICTED LITTLE DAMAGE ON THE JAPANESE AND OFTEN ENDED UP ON THE DEFENSIVE. SURPRISINGLY THE JAPANESE SHOT DOWN ONLY A FEW P-40S IN THOSE INITIAL DAYS OF COMBAT, MOSTLY DUE TO LUCK BECAUSE THE LIGHT ARMAMENT ON THE ZEROS HAD LITTLE EFFECT ON THE HEAVY ARMOR PLATING ON THE P-40.²⁹

WHILE THE P-40 WAS AT A DISADVANTAGE TO THE ZERO IN A DOGFIGHT, THE GREATER PROBLEM FACING US FORCES IN THE PHILIPPINES WAS A LACK OF NUMBERS. THE JAPANESE IN THE CAMPAIGN EMPLOYED 296 AIRCRAFT, 125 OF THEM PURSUIT, AGAINST GEORGE'S TOTAL OF 114 PURSUIT

²⁴ Edmonds 38-39, 95, 100 and Bartsch 47, 89-91. Note: the bombers that attacked Iba were estimated at 28,000 feet and the bombers attacking Clark estimated above 18,000. The limit of the pilots without oxygen was between 15,000 and 18,000 feet.

²⁵ Perret, 114-115.

²⁶ Bartsch, 35.

²⁷ Ibid., 429.

²⁸ Note: The P-40s also carried a locally produced, 52-gallon external fuel tank to extend their range, when required for long flights over the Pacific. Bartsch, 93, 157-158 and Lt Col Birrell Walsh, Letter to Hindustan Aircraft Ltd., 27 April 1942, AFHRA 830.8641-1 and Edmonds, 354.

²⁹ Edmonds, 92, 162 and Bartsch, 429.

AIRCRAFT.³⁰ ON THE ATTACKS AGAINST IBA AND CLARK ALONE, THE JAPANESE EMPLOYED 106 BOMBERS AND 53 ZEROS.³¹ EVEN IF THE FEAF COULD HAVE INTERCEPTED THE BOMBERS WITH EVERY AVAILABLE PURSUIT AIRCRAFT, THEY WOULD NOT HAVE ACHIEVED A SIGNIFICANT NUMERICAL ADVANTAGE AGAINST THE BOMBERS, LET ALONE THEIR FIGHTER ESCORTS. BOTH THE LACK OF SUFFICIENT NUMBERS AND THE POOR TRAINING RESULTED FROM THE LATE DECISION BY THE UNITED STATES TO PROTECT THE PHILIPPINES. IT DID NOT GIVE THE PURSUIT PILOTS ADEQUATE TIME TO PREPARE.

TWO SIGNIFICANT FACTORS INFLUENCED THE TIMING OF THE PHILIPPINES' BUILDUP. FIRST, UNTIL THE FALL OF 1940, THE US MILITARY BASED WAR PLANS FOR THE PHILIPPINES ON ALLOWING THE JAPANESE TO TAKE THE PHILIPPINES. A MINIMAL FORCE STATIONED IN THE PHILIPPINES WOULD HOLD OUT AS LONG AS POSSIBLE, BUT THE PLANS MADE NO PROVISION TO SEND THEM IMMEDIATE REINFORCEMENTS. INSTEAD, THE UNITED STATES WOULD RETAKE THE PHILIPPINES AS PART OF A GREATER ISLAND HOPPING CAMPAIGN SIMILAR TO THE ONE ACTUALLY EXECUTED IN WORLD WAR II.³² HOWEVER, AS THE JAPANESE THREAT LOOMED IN THE PACIFIC, THE UNITED STATES ALTERED ITS PLANS TO PREVENT THE JAPANESE FROM TAKING THE PHILIPPINES.³³ THE SECOND MAJOR FACTOR WAS GENERAL MACARTHUR'S ESTIMATE THAT THE JAPANESE WOULD NOT ATTACK BEFORE 1 APRIL 1942.³⁴ THIS ESTIMATED DATE EXACERBATED THE BUILD-UP PROBLEM. NOT ONLY WERE THERE INSUFFICIENT FORCES ON THE PHILIPPINES, BUT THOSE THAT HAD ARRIVED WERE NOT FOCUSED ON A CONFLICT IN THE NEAR FUTURE. ON HIS ARRIVAL TO THE PHILIPPINES ON 5 NOVEMBER 1941, BRERETON NOTES, HE FOUND HIS TROOPS WERE STILL ON A RELAXED, PEACETIME SCHEDULE, "THE IDEA OF AN IMMINENT WAR SEEMED FAR REMOVED FROM THE MINDS OF MOST."³⁵

THE LATE BUILD-UP CAUSED BY POLICY CHANGES CERTAINLY DEGRADED THE PERFORMANCE OF PURSUIT AVIATION; BUT EVEN WITH THOSE LIMITATIONS, PURSUIT AVIATION SUFFERED ON 8 DECEMBER AS MUCH FROM EXECUTION ERRORS AS ANYTHING ELSE. EXECUTION FAILED SPECIFICALLY IN THREE SIGNIFICANT AREAS: THE AIR WARNING SYSTEM, COMMUNICATIONS, AND OPERATIONAL DECISIONS.

AS NOTED IN PRIOR CHAPTERS, A ROBUST AIR WARNING SYSTEM IS THE KEY TO EFFECTIVE DEFENSIVE PURSUIT EMPLOYMENT. UNFORTUNATELY, THE AIR WARNING SYSTEM WAS THE WEAK LINK IN THE AIR DEFENSE OF THE PHILIPPINES. THE CENTERPIECE OF THE AIR WARNING SYSTEM WAS THE SCR-270 RADAR AT IBA FIELD. ALTHOUGH SEVEN RADAR SETS WERE IN THE PHILIPPINES, ONLY TWO WERE OPERATIONAL. OF THE TWO OPERATIONAL RADARS, ONLY THE RADAR AT IBA WAS LINKED TO THE FEAF WARNING SYSTEM.³⁶ ON THE NIGHTS PRIOR TO THE ATTACK, THE RADAR AT IBA HAD PROVEN ITS ABILITY TO TRACK JAPANESE RECONNAISSANCE MISSIONS, BUT SIMULTANEOUSLY FOUND THAT IT COULD NOT COMMUNICATE WITH AMERICAN FIGHTERS OUTSIDE OF 20 MILES.³⁷ THAT THE FEAF FOUND NO SOLUTION OR WORK AROUND BEFORE THE JAPANESE ATTACKED CERTAINLY CONTRIBUTED TO THE FEAF'S INABILITY TO INTERCEPT THE JAPANESE BOMBERS. ON THE MORNING OF 8 DECEMBER, THE RADAR AT IBA SUCCESSFULLY DETECTED AND TRACKED AT LONG RANGE THE TWO-PRONG JAPANESE ATTACK THAT STRUCK IBA AND CLARK FIELDS. IBA'S RADAR WARNING GAVE THE 24TH PURSUIT GROUP OVER AN HOUR WARNING, SUFFICIENT TIME TO SCRAMBLE THREE SQUADRONS TO DEFEND AGAINST THE ATTACKS: THE 3RD PS AT IBA, THE 17TH PS AT CLARK, AND THE 21ST PS AT NICHOLS FIELD.³⁸ HOWEVER, THE INABILITY TO COMMUNICATE TO THE PILOTS, INCLUDING THE 3RD PS HOLDING IN A STANDING PATROL OVER IBA PREVENTED A SUCCESSFUL INTERCEPTION.

BACKING UP THE RADAR WAS AN OBSERVATION NETWORK THAT PROVED TO BE EFFECTIVELY WORTHLESS. POORLY TRAINED FILIPINO OBSERVERS OPERATED THE OBSERVATION NETWORK. A LACK

³⁰ This number includes the five squadrons of the 24th Pursuit Group plus planes assigned to the 24th headquarters and one squadron of Filipino P-26s.

³¹ Bartsch, 428, 447n.

³² Edward S. Miller, *War Plan Orange* (Annapolis, Md.: Naval Institute Press, 1991), 35-38, 67-76.

³³ Craven and Cate, *Plans and Early Operations*, 176-177.

³⁴ Brereton, *Brereton Diaries*, 19.

³⁵ Miller, 26 and Brereton, *Brereton Diaries*, 21.

³⁶ Craven and Cate, *Plans and Early Operations*, 186 and Miller, 30.

³⁷ The British overcame this problem by using VHF radios, which had allowed much improved range over the American HF radios. After Pearl Harbor, the British and Americans shared technology enabling the Americans to transition to VHF radios. Craven and Cate, *Plans and Early Operations*, 289-293.

³⁸ Edmonds, 99.

OF TIME PRECLUDED TRAINING THE FILIPINOS IN AIRCRAFT IDENTIFICATION, THUS THEY REPORTED ALL AIR ACTIVITY AS HOSTILE. IN A TEST BEFORE THE WAR, THE OBSERVATION NETWORK REQUIRED 46 MINUTES TO COMMUNICATE THE FIRST AIRCRAFT SIGHTINGS BACK TO THE 24TH PG HEADQUARTERS.³⁹ ONCE THE JAPANESE DESTROYED THE RADAR AT IBA, THE OBSERVATION NETWORK NEVER MANAGED TO PROVIDE MORE THAN A FEW MINUTES WARNING TO ALERT PILOTS, THUS PREVENTING ANY SUBSEQUENT SUCCESSFUL INTERCEPTIONS.⁴⁰ REGARDLESS, EVEN IF THE OBSERVATION NETWORK WERE ROBUST, POOR COMMUNICATIONS STILL WOULD HAVE LIMITED THE EFFECTIVENESS OF PURSUIT.

COMMUNICATION PROBLEMS, SOME OF THEIR OWN MAKING, EXACERBATED THE FIGHTER PILOTS' TROUBLES ON 8 DECEMBER. AT IBA, THE 3RD PURSUIT SQUADRON NEVER REGROUPED AFTER TAKEOFF DUE TO POOR COMMUNICATIONS. CONTRADICTIONARY ORDERS AND PEOPLE SHOUTING ON THE RADIO SWAMPED THE RADIO FREQUENCY. ONE PILOT NOTED, "AT TIMES IT WAS ALMOST IMPOSSIBLE TO TALK EVEN BETWEEN PLANES FLYING WING TO WING." THE POOR COMMUNICATIONS CAUSED ALL EIGHTEEN AIRCRAFT OF THE 3RD PS TO ABANDON THEIR STATION OVER IBA WITH TWELVE OF THE AIRCRAFT DEPARTING JUST FIVE MINUTES BEFORE THE JAPANESE ATTACKED.⁴¹

IN ADDITION TO POOR RADIO COMMUNICATIONS, INADEQUATE LAND COMMUNICATIONS ALSO CONTRIBUTED TO THE 24TH PURSUIT GROUP'S FAILURE. THE 34TH PURSUIT SQUADRON, STATIONED AT DEL CARMEN FIELD, 14 MILES SOUTH OF CLARK FIELD, NEVER RECEIVED THEIR ORDER TO SCRAMBLE TO DEFEND CLARK. ALTHOUGH THE 24TH PURSUIT GROUP HEADQUARTERS ORDERED THEM AIRBORNE ALMOST AN HOUR BEFORE THE JAPANESE ATTACKS, THEY NEVER RECEIVED THE MESSAGE. THEY SUBSEQUENTLY TOOK OFF, WITHOUT ORDERS, ONLY AFTER SEEING RISING PILLARS OF DUST AND SMOKE CAUSED BY JAPANESE BOMBS HITTING CLARK. LIKEWISE, FOR THE 20TH PURSUIT SQUADRON AND B-17S AT CLARK, THERE WAS NO WARNING OF THE INBOUND ATTACK. ALTHOUGH THE AIR WARNING CENTER AT NIELSON FIELD KNEW THE ATTACK WAS IMMINENT, THE FIRST WARNING THE PILOTS AT CLARK HAD WAS A VISUAL SIGHTING OF THE JAPANESE BOMBERS BY AIRMEN ON THE GROUND.

NEVERTHELESS, COMMUNICATIONS WERE ONLY PART OF THE REASON BEHIND THE FAILURE TO INTERCEPT THE JAPANESE. THE AIR WARNING CENTER HAD THE STRATEGIC PICTURE RELAYED FROM THE RADAR AT IBA AND RETAINED SOME ABILITY TO COMMUNICATE THE SITUATION. AS LATE AS 1220, TWENTY MINUTES BEFORE THE ATTACK ON CLARK, COLONEL GEORGE AT THE AIR WARNING CENTER ISSUED AN ORDER TO THE 24TH PURSUIT GROUP COMMANDER, MAJ ORRIN GROVER, TO INTERCEPT THE FORCE APPROACHING CLARK. MAJOR GROVER, FOR REASONS NEVER FULLY EXPLAINED, FAILED TO SCRAMBLE HIS REMAINING ASSETS AT CLARK INCLUDING THE 20TH PURSUIT SQUADRON. AS A RESULT, THE 20TH PS LOST TWO-THIRDS OF ITS FORCE ON THE GROUND.⁴²

MAJ GROVER'S FAILURE TO NOTIFY THE 19TH BOMB GROUP OR FIGHTERS AT CLARK WAS THE FINAL STRAW IN A SERIES OF MISCUES IN CONTROL OF THE 24TH PURSUIT GROUP. WHILE THE 3RD PURSUIT SQUADRON OVER IBA FAILED TO INTERCEPT THE BOMBERS DUE TO POOR COMMUNICATIONS, GROVER LEFT CLARK FIELD UNPROTECTED BY A CONSCIOUS DECISION. INITIALLY, GROVER SCRAMBLED BOTH THE 17TH AND 21ST PURSUIT SQUADRONS TO DEFEND CLARK FIELD, BUT ONCE AIRBORNE, HE RECALLED BOTH TO MANILA BAY TO DEFEND THE CAPITAL CITY. LIKELY GROVER THOUGHT THE 34TH PS WAS DEFENDING CLARK WITH THEIR OUTDATED P-35S, BUT REGARDLESS HIS EFFORTS SEEMED FOCUSED ON DEFENDING THE CAPITAL CITY AND NOT THE AIRFIELDS.⁴³ IN THE WORDS OF ONE STUDY, "GROVER FAILED TO UNDERSTAND THAT HIS PRIMARY RESPONSIBILITY SHOULD HAVE BEEN TO PROTECT THE AIRFIELDS, ESPECIALLY CLARK AND ITS BOMBERS."⁴⁴ BRERETON KNEW THE VULNERABILITY OF THE BOMBERS AND AIRFIELDS IN GENERAL, BUT SOMEHOW FAILED TO COMMUNICATE HIS PRIORITIES TO GROVER. AS A RESULT, GROVER SET A POOR DEFENSIVE POSTURE AND GAVE THE JAPANESE AN UNIMPEDED STRIKE AGAINST CLARK. THAT STRIKE, COMBINED WITH THE ATTACK AT IBA, MORTALLY WOUNDED THE ANTI-AIRCRAFT DEFENSES OF THE PHILIPPINES.

EVALUATING PURSUIT AVIATION IN THE PHILIPPINES

NOTABLY, THE FFAF'S FAILURE IN THE PHILIPPINES WAS NOT A SHORTCOMING OF INTERWAR PURSUIT DOCTRINE. THE AIR BATTLE FOUGHT OVER THE PHILIPPINES ALIGNED CLOSELY WITH PURSUIT

³⁹ Ibid., 23-24.

⁴⁰ Dyess, *The Dyess Story*, 32.

⁴¹ Edmonds, 94-99, quote on 94.

⁴² Edmonds, 100-103 and Miller, 31-32.

⁴³ Edmonds, 84-85.

⁴⁴ Miller, 32.

DOCTRINE, EMPLOYING AIRBORNE INTERCEPTORS IN CONJUNCTION WITH AN AIR-WARNING SYSTEM COMPOSED OF BOTH RADAR AND VISUAL OBSERVATION POINTS. NEVERTHELESS, PURSUIT PILOTS STILL FAILED TO MEET THEIR OBJECTIVES; THE JAPANESE OUTMATCHED THEM IN THE AIR BATTLE. THE FEAF'S DEFENSE OF THE PHILIPPINES FAILED BECAUSE OF SHORTFALLS IN THREE CRITICAL AREAS: FIGHTER PERFORMANCE, AIR-WARNING SYSTEM OPERATIONS, AND TRAINING.

CLEARLY, THE UNITED STATES FIGHTER PERFORMANCE LAGGED THAT OF THE JAPANESE. THE ZERO OUTMATCHED THE P-40E IN MOST CATEGORIES. ITS MANEUVERABILITY AND SUPERIOR CLIMB RATE GAVE THE ZERO A DISTINCT ADVANTAGE IN A DOGFIGHT. EVEN SO, THE P-40, AS DEMONSTRATED BY CHENNAULT AND THE AMERICAN VOLUNTEER GROUP IN CHINA, COULD HOLD ITS OWN IN THE AIR IF IT AVOIDED DOGFIGHTS AND USED ITS SUPERIOR DIVE SPEED IN HIT-AND-RUN ATTACKS AGAINST THE ZERO.⁴⁵ MORE TROUBLING, HOWEVER, WAS THE POOR PERFORMANCE OF THE P-40 AT HIGH ALTITUDES. PURSUIT PILOTS EXPECTED TO INTERCEPT BOMBERS AT HIGH ALTITUDE, YET THE P-40S DEVELOPED AND FLOWN BY THE UNITED STATES LACKED THE HIGH ALTITUDE PERFORMANCE TO ACCOMPLISH THEIR PRIME MISSION. UNITED STATES BOMBERS, SPURRED BY CIVILIAN TECHNOLOGY ADVANCES, WERE STILL MORE ADVANCED THAN THE AMERICAN FIGHTERS ENTERING WORLD WAR II. THE AMERICAN BOMBERS, LIKE THE B-17, INCORPORATED TURBOCHARGED ENGINES TO MAINTAIN PERFORMANCE AT HIGH-ALTITUDE, YET THE AMERICAN FIGHTERS DID NOT BECAUSE THE AIR CORPS DEEMED TURBOCHARGERS TOO HEAVY AND TOO COMPLEX FOR USE IN FIGHTERS.⁴⁶ THIS TECHNOLOGICAL LAG IN FIGHTER DEVELOPMENT, ALBEIT NOT DECISIVE IN THE PHILIPPINES, HAMSTRUNG THE PURSUIT PILOTS THERE FROM THE START.

THE SECOND LESSON FROM THE PHILIPPINES WAS THE IMPORTANCE OF AN EFFECTIVE AIR-WARNING NETWORK. THE PHILIPPINES VALIDATED PURSUIT PILOTS' CLAIMS REGARDING THE NECESSITY OF APPROPRIATE WARNING NETWORKS. BEYOND SIMPLY HAVING A ROBUST NETWORK, EFFECTIVE DEFENSE DEMANDED SOLID COMMUNICATIONS AND EFFECTIVE COMMAND AND CONTROL. THE PURSUIT PILOTS HAD NEITHER IN THE PHILIPPINES. LACK OF TIME AND TRAINING WITH THE SYSTEM PREVENTED THE 24TH PURSUIT GROUP FROM IRONING OUT THE DIFFICULTIES FACED IN COMMUNICATIONS, COMMAND, AND CONTROL BEFORE CONFRONTING THE JAPANESE. MUCH LIKE THE SITUATION WITH THE .50-CALIBER GUNS ON THE P-40ES THAT THE GROUP DID NOT TEST UNTIL COMBAT, THE COMMUNICATIONS, COMMAND, AND CONTROL REQUIRED TO EMPLOY EFFECTIVELY THEIR FIGHTERS WAS UNTESTED AS WELL. IF THE 24TH PURSUIT GROUP HAD EXERCISED THE SYSTEM BEFORE THE ATTACKS, THE OUTCOME COULD HAVE BEEN SIGNIFICANTLY DIFFERENT. THE PURSUIT PILOTS ON THE PHILIPPINES HAD THE RIGHT IDEA FOR THE AIR-WARNING NETWORK. THEY SIMPLY LACKED THE TIME TO CREATE A ROBUST NETWORK WITH A REDUNDANT RADAR AND OBSERVATION SYSTEM.⁴⁷

THE THIRD CRITICAL LESSON FROM THE PHILIPPINES WAS INSUFFICIENT TRAINING. UNLIKE THE AMERICAN VOLUNTEER GROUP IN CHINA, WHICH HAD MARKED SUCCESS FLYING P-40S AGAINST JAPANESE, THE 24TH PURSUIT GROUP PILOTS HAD ONLY MINIMAL TRAINING IN THEIR AIRCRAFT AND ALMOST NONE IN COMBAT TACTICS TO DEAL WITH THE JAPANESE. THUS, IN THEIR FIRST DAYS OF COMBAT, THE 24TH PG PILOTS RELIED ON TRIAL AND ERROR TO DEVELOP TACTICS TO SURVIVE AGAINST THE JAPANESE.⁴⁸ THE 24TH'S LACK OF TRAINING STEMMED MOSTLY FROM THE UNITED STATES' GENERAL LACK OF READINESS TO ENTER COMBAT AND ITS LATE DECISION TO DEFEND THE PHILIPPINES, NOT FROM ANY FAULT OF INTERWAR PURSUIT DEVELOPMENT. THAT IS NOT SAYING THAT INTERWAR PURSUIT DEVELOPMENT WAS WITHOUT FAULT IN TRAINING. PILOTS THROUGHOUT THE AIR CORPS DISMISSED THE JAPANESE CAPABILITIES; HENCE, LITTLE TIME WAS DEVOTED TO PREPARING TO FIGHT THE JAPANESE. MANY AMERICAN PILOTS, THEREFORE, WERE GREATLY SURPRISED WHEN THEY FIRST MET THE ZERO; THEY DID NOT EXPECT TO FIND A JAPANESE FIGHTER THAT COULD OUTPERFORM THEM.

⁴⁵ Bartsch, 430.

⁴⁶ Perret, 108.

⁴⁷ The air-warning network was not a problem limited to the Philippines. When the Japanese attacked, the United States had only the formative skeleton of a continental air-warning network. Rudely awakened by the attacks, the Army set up an air warning system built primarily with radars using technology shared with the British. That system, however, was not fully functional until late 1943. Craven and Cate, *Plans and Early Operations*, 286-293.

⁴⁸ Bartsch, 430.

Northwest Africa: Operation Torch

THE AIR BATTLES OF NORTHWEST AFRICA ARE BEST KNOWN FOR CENTRALIZING THE CONTROL OF THE AIR FORCES. CURRENT AIR FORCE DOCTRINE LISTS THE NORTHWEST AFRICAN CAMPAIGN SPECIFICALLY AS A TURNING POINT FOR AMERICAN CONTROL OF AIR POWER.⁴⁹ HOWEVER, THE BATTLE FOR AIR SUPERIORITY OVER AFRICA WAS EQUALLY IMPORTANT. MUCH OF THE DIFFICULTY US AIR FORCES ENCOUNTERED IN THE CAMPAIGN WAS DUE TO A LACK OF AIR SUPERIORITY. AS GEOFFREY PERRET, A NOTED HISTORIAN WRITES, "AIR SUPPORT WAS AN UPHILL STRUGGLE IN TUNISIA, NOT BECAUSE OF INTERFERENCE FROM THE GROUND, BUT BECAUSE OF INTERFERENCE FROM THE AIR."⁵⁰ AS SUCH, THE AFRICAN CAMPAIGN TESTED THE LIMITS AND ABILITIES OF ARMY AIR FORCES PURSUIT PILOTS IN ONE OF THEIR FIRST OFFENSIVE CAMPAIGNS.

THE CAMPAIGN IN NORTHWEST AFRICA WAS A JOINT BRITISH-AMERICAN CAMPAIGN DRIVING EAST TOWARDS TUNISIA AFTER MAKING AMPHIBIOUS LANDINGS IN MOROCCO AND ALGERIA. COMMAND OF THE US AIR EFFORT INITIALLY FELL TO MAJ GEN JAMES H. DOOLITTLE, COMMANDER OF THE TWELFTH AIR FORCE, BUT LATER MAJ GEN CARL A. SPAATZ, TOOK COMMAND OF THE NORTHWEST AFRICAN AIR FORCES (NAAF) WHEN THE NINTH AND TWELFTH AIR FORCES COMBINED TO FORM THE MEDITERRANEAN AIR COMMAND UNDER BRITAIN'S AIR CHIEF MARSHAL ARTHUR TEDDER.⁵¹

PURSUIT AVIATION IN AFRICA FACED TWO BROAD CHALLENGES. JUST AS IN THE PHILIPPINES, UNITED STATES PURSUIT AIRCRAFT WERE NOT UP TO PAR WITH THEIR GERMAN COUNTERPARTS; ADDITIONALLY THE PURSUIT PILOTS LACKED THE TRAINING REQUIRED FOR THE VARIOUS MISSIONS THEY FLEW. IN TERMS OF AIRCRAFT, THE BRITISH SPITFIRE AND GERMAN ME-109 BOTH OUTPERFORMED THE P-40, THE TOP-OF-THE-LINE AMERICAN FIGHTER. EVEN MORE TROUBLING, THE GERMANS IN 1942 INTRODUCED THE FW-190, WHICH NO ALLIED FIGHTER AT THE TIME COULD MATCH FOR PERFORMANCE. THE BRITISH, THEREFORE, DEEMED THE AMERICAN P-40S, AS UNLIKELY TO SURVIVE AGAINST THE GERMAN THREAT AND CONVERTED MANY OF THE AMERICAN P-40S INTO FIGHTER-BOMBERS FREEING THE BRITISH SPITFIRES TO PERFORM FIGHTER COVER AGAINST THE ME-109S AND FW-190S.⁵² THE AMERICANS CAME TO A SIMILAR CONCLUSION IN THEIR EARLY EXPERIENCES AND FOLLOWED BRITAIN'S LEAD. THEY ALSO USED THE BRITISH BUILT SPITFIRES, FLOWN BY AMERICAN PURSUIT SQUADRONS, TO PROVIDE TOP COVER FOR P-40S EXECUTING GROUND ATTACK.⁵³

IN ADDITION TO FLYING GROUND ATTACK MISSIONS IN NORTH AFRICA, P-40S ALSO ESCORTED BOMBER MISSIONS. THE TROUBLE WAS THAT US PURSUIT PILOTS HAD NOT TRAINED FOR EITHER THE GROUND ATTACK OR THE ESCORT MISSIONS. BRERETON NOTED, "FIGHTER-BOMBER TECHNIQUE WAS NOT TAUGHT IN THE STATES. INDEED, THERE EXISTED A SCHOOL OF THOUGHT PRIOR TO OUR ENTRY INTO THE WAR WHICH CONSIDERED SUCH EMPLOYMENT UNECONOMICAL AND INEFFECTIVE. THE TECHNIQUE OF FIGHTER COVER FOR OUR BOMBERS WAS UNKNOWN IN OUR AIR FORCES AND IT IS MOST DIFFICULT TO INDOCTRINATE."⁵⁴ THE PURSUIT PILOTS THUS RECEIVED THEIR FIRST FIGHTER-BOMBER AND ESCORT TRAINING AFTER ARRIVING IN THEATER. THE PILOTS OF THE 33RD FIGHTER GROUP, THE MOST ACTIVE FIGHTER GROUP IN THE NAAF, LED BY COL WILLIAM W. MOMYER, ARE A PRIME EXAMPLE. THE 33RD HAD BEEN TRAINED FOR THE AIR DEFENSE OF THE NORTHEASTERN UNITED STATES AND NOT FOR AIR-TO-GROUND OPERATIONS. THEY HAD TO LEARN AIR-TO-GROUND OPERATIONS IN AFRICA, NOT PRIOR TO THE WAR, AS THEIR LEADERS WOULD HAVE PREFERRED.⁵⁵

⁴⁹ Air Force Doctrine Document (AFDD) 2-8, *Command and Control*, 16 February 2001, 5.

⁵⁰ Perret, 190.

⁵¹ Daniel R. Mortensen, *A Pattern for Joint Operations: World War II Close Air Support, North Africa* (Washington, D.C.: Office of Air Force History and U.S. Army Center of Military History, 1987), chart 2.

⁵² Perret, 178, 186.

⁵³ Wesley Frank Craven and James Lea Cate, eds., *The Army Air Force in World War II*, vol. 2, *Europe: Torch to Pointblank, August 1942 to December 1943* (Chicago, Ill.: The University of Chicago Press, 1949), 175.

⁵⁴ Brereton, *Brereton Diaries*, 143.

⁵⁵ David R. Mets, "A Glider in the Propwash of the Royal Air Force? Gen Carl A. Spaatz, the RAF, and the Foundations of American Tactical Air Doctrine," in *Airpower and Ground Armies: Essays on the Evolution of Anglo-American Air Doctrine 1940-1943*, ed. Daniel R. Mortensen (Maxwell AFB, Ala.: Air University Press, 1998), 48, 59.

BOMBER ESCORT IN NORTH AFRICA WAS A MISSION AREA THE ROYAL AIR FORCE (RAF) LEARNED THROUGH EXPERIENCE PRIOR TO THE UNITED STATES' ENTRY INTO THE WAR. THE RAF DETERMINED ITS BOMBERS HAD TO HAVE AN ESCORT TO SURVIVE DURING DAYLIGHT OPERATIONS. THEIR ARGUMENTS CONVINCED DOOLITTLE TO ESCORT HIS BOMBERS AS WELL. THEY TAUGHT THEIR TECHNIQUES TO AMERICAN FORCES AS THEY ARRIVED IN NORTH AFRICA ENABLING AMERICAN FIGHTERS TO ESCORT A VARIETY OF PLANES. DURING THE COURSE OF THE CAMPAIGN, AMERICAN PURSUIT PILOTS ESCORTED BOMBERS, FIGHTER-BOMBERS, ATTACK AIRCRAFT, AND TRANSPORTS.⁵⁶ LIKE THE GROUND ATTACK MISSIONS, ESCORT WAS A MISSION AREA AAF PURSUIT PILOTS HAD NOT TRAINED FOR EVEN THOUGH AAF DOCTRINE AND ACTS TEACHINGS LISTED BOTH MISSIONS AS RESPONSIBILITIES OF PURSUIT.⁵⁷

WHY PURSUIT PILOTS WERE NOT READY FOR BOTH MISSIONS UPON ARRIVING IN AFRICA IS A VALID QUESTION. IN TERMS OF ESCORT RESPONSIBILITY, THE ANSWER STEMS FROM THE BOMBER VERSUS FIGHTER DEBATE. FM 1-5 CLEARLY LAID OUT THE TWO OVERRIDING ARGUMENTS THAT FRAME THE DEBATE. FIRST, THE LIMITED RANGE OF PURSUIT FIGHTERS PREVENTED THEM FROM ESCORTING LONGER-RANGE AIRCRAFT TO THEIR TARGET. SECOND AND MORE IMPORTANTLY, US AIRMEN FELT THEIR BOMBERS DID NOT NEED AN ESCORT. FM 1-5 NOTES, "THE NEED FOR ACCOMPANYING SUPPORT IS DETERMINED BY THE EFFECTIVENESS OF THE ENEMY PURSUIT FORCES. ACCOMPANYING SUPPORT IS REQUIRED BY FRIENDLY AIRCRAFT WHEN THE DEFENSIVE FIRE POWER OF [FRIENDLY AIRCRAFT] IS INADEQUATE."⁵⁸ BECAUSE BOMBARDMENT PROPONENTS FELT US BOMBERS HAD ADEQUATE DEFENSIVE FIREPOWER TO SELF-DEFEND, THERE WAS LITTLE IMPETUS TO TRAIN FOR THE ESCORT ROLE UNTIL US BOMBERS PROVED VULNERABLE TO ENEMY PURSUIT.

NEVERTHELESS, IN NORTH AFRICA THE AAF READILY TRANSITIONED TO ESCORTING BOMBERS. THE AAF'S SHIFT IN MENTALITY STEMMED FROM THE TYPE OF AIRCRAFT, NUMBERS, AND TARGETS IN THE CAMPAIGN. FIRST, A LARGE NUMBER OF THE BOMBARDMENT AIRCRAFT WERE MEDIUM BOMBERS THAT LACKED THE HEAVY DEFENSIVE ARMAMENT OF THE B-17 OR B-24. TO SURVIVE, THE MEDIUM BOMBERS NEEDED FIGHTER ESCORT. SECOND, THE NAAF NEVER COULD COBBLE TOGETHER A SUFFICIENTLY LARGE NUMBER OF BOMBERS INTO A SINGLE PACKAGE TO SELF-DEFEND. IN THE STRATEGIC ATTACKS AGAINST GERMANY, LT GEN IRA C. EAKER DEEMED THE CRITICAL FORMATION SIZE TO BE 300 PLANES, WHEREAS THE NAAF OFTEN EMPLOYED BOMBING RAIDS OF LESS THAN 25 BOMBERS.⁵⁹ FINALLY, IN THE MEDITERRANEAN THEATER, MOST OF THE TARGETS WERE WITHIN RANGE OF THE FIGHTER ESCORTS. SPECIFICALLY, THE LONG-RANGE P-38 EQUIPPED WITH EXTERNAL FUEL TANKS HAD SUFFICIENT RANGE TO ESCORT MOST OF THE BOMBER MISSIONS.⁶⁰ THE VALUE OF ESCORT WAS IMMEDIATELY APPARENT. EVEN WITH PITIFULLY SMALL BOMBER FORMATIONS, ESPECIALLY COMPARED TO THE ARMADAS LAUNCHED AGAINST GERMANY IN 1944 AND 1945, THE NAAF'S B-17 LOSSES REMAINED LOW DAY AFTER DAY MOSTLY BECAUSE OF P-38 ESCORT. ALTHOUGH ONLY A SMALL NUMBER OF P-38S TYPICALLY ESCORTED THE BOMBERS, THEY WERE ENOUGH TO DIVIDE THE ENEMY'S ATTENTION BETWEEN THE FIGHTERS AND THE BOMBERS. THE ESCORTS, COUPLED WITH THE GERMAN'S UNFAMILIARITY WITH THE AMERICAN BOMBER AND THEIR LIMITED NUMBERS, ALLOWED THE NAAF TO ACHIEVE A HIGH BOMBER SURVIVAL RATE.⁶¹

THE SECOND MISSION US PURSUIT PILOTS WERE NOT READY FOR WAS GROUND ATTACK. THE LACK OF TRAINING FOR AIR-TO-GROUND OPERATIONS IS ATTRIBUTABLE TO AIR-TO-GROUND PERCEPTIONS AND THE STRATEGIC CONTEXT OF THE FIGHT ENVISIONED FOR PURSUIT AIRCRAFT. ACTS DID TEACH AIR-TO-GROUND AS A SUPPLEMENTAL MISSION OF PURSUIT AVIATION AND HAD A DEDICATED LECTURE ON PURSUIT IN SUPPORT OF GROUND FORCES. THE *PURSUIT AVIATION* TEXT OF SEPTEMBER 1939 NOTES, "IT IS CONCEIVABLE THAT ENOUGH PURSUIT MIGHT BE AVAILABLE OR THAT IT MIGHT BE DETACHED

56 Brig Gen Monro MacCloskey, *Torch and the Twelfth Air Force* (New York, N.Y.: Richards Rosen Press, 1971), 138, 145-149.

57 War Department, Air Corps Field Manual (FM) 1-5, *Employment of Aviation in the Army*, 15 April 1940, 40-42, AFHRA 170.121001-5 and Air Corps Tactical School (ACTS), *Pursuit Aviation*, (Maxwell Field, Ala.: Air Corps Tactical School, September 1939), 67-69, 103-107, AFHRA 248.101-8.

58 FM 1-5, 15 April 1940, 41.

59 David E. Johnson, *Fast Tanks and Heavy Bombers: Innovation in the US Army 1917-1945* (Ithaca, N.Y.: Cornell University Press, 1998), 206.

60 Craven and Cate, *Europe: Torch to Point Blank*, 121-125.

61 *Ibid.*, 121.

TEMPORARILY FROM THE AIR FORCE IN CRITICAL SITUATIONS AND ASSIGNED TO THE GROUND FORCES FOR DIRECT SUPPORT.” IT THEN LISTS THE TARGETS SUSCEPTIBLE TO PURSUIT ATTACK SPECIFICALLY NOTING, “PURSUIT AVIATION CAN EFFECTIVELY ATTACK ANY HOSTILE AIRDROME, WITHIN ITS RANGE OF OPERATIONS, WITH MACHINE GUNS AND LIGHT BOMBS.”⁶² HOWEVER, THE TEXT HIGHLIGHTS THE AIR CORPS BIAS AGAINST GROUND ATTACK STATING,

THE PURSUIT AIRPLANE AND ITS ARMAMENT ARE DESIGNED FOR A PARTICULAR PURPOSE, THE DESTRUCTION OF AIRCRAFT IN THE AIR. IT IS AN EXPENSIVE WEAPON, THE REPLACEMENT OF THE AIRPLANE AND THE PILOT ARE COSTLY IN MONEY AND TIME. THEREFORE, IT IS ONLY GOOD SENSE AND GOOD ECONOMY TO AVOID USING THEM ON A JOB THAT CAN BE DONE, AND PERHAPS BETTER TOO, BY ANOTHER WEAPON MORE SUITED TO THE TASK.⁶³

LIKewise, AIR CORPS DOCTRINE IN FM 1-5 ALSO RECOGNIZED THE CAPABILITY OF PURSUIT AIRCRAFT TO PERFORM TO AN AIR-TO-GROUND ROLE, BUT SIMILARLY BOUNDS ITS RECOMMENDATION. IT STATES, “THE DIVERSION OF PURSUIT FORCES FOR PURPOSES WHICH CAN BEST BE ACCOMPLISHED BY OTHER AVIATION FORCES RARELY WILL BE JUSTIFIED. HOWEVER, PURSUIT AVIATION MAY BE TEMPORARILY EMPLOYED IN EMERGENCIES FOR THE ATTACK OF PERSONNEL OR LIGHT MATERIAL ON THE SURFACE.”⁶⁴ CLEARLY, AVIATORS PREFERRED NOT TO EMPLOY PURSUIT AVIATION IN AN AIR-TO-GROUND ROLE, LARGELY BECAUSE THEY ENVISIONED PURSUIT PRIMARILY AS A DEFENSIVE FORCE, DESIGNED TO PROTECT THE UNITED STATES, BUT ALSO BECAUSE PURSUIT HAD PROVEN INFERIOR AT ATTACK IN EXERCISES SUCH AS THE 1929 MANEUVERS IN OHIO.

NEVERTHELESS, THE UNITED STATES USED PURSUIT AIRCRAFT FOR ATTACK IN NORTH AFRICA IN PART BECAUSE OF A SHORTAGE OF ATTACK AIRCRAFT AVAILABLE FOR OPERATION TORCH. PRIOR TO THE BATTLE OF BRITAIN, THE UNITED STATES’ FEAR WAS AN ATTACK DIRECTLY AGAINST THE UNITED STATES FROM AXIS BASES SET UP IN THE WESTERN HEMISPHERE. HENCE, THE PURSUIT GROUPS, SUCH AS THE 33RD PREVIOUSLY MENTIONED, TRAINED TO DEFEND THE UNITED STATES FROM HOSTILE BOMBERS. ONCE BRITAIN’S SURVIVAL WAS NO LONGER IN QUESTION, THEIR THOUGHTS SHIFTED TO A STRATEGIC AIR CAMPAIGN AGAINST GERMANY. THE REQUIRED FORCE FOR THAT CAMPAIGN CONSISTED OF AIR-TO-AIR FIGHTERS AND BOMBERS, NOT ATTACK AIRCRAFT. WHEN THE UNITED STATES AGAIN SHIFTED ITS STRATEGY TO AN INVASION OF AFRICA, THE ARMY AIR FORCES WERE NOT READY. THE POLICY SHIFT CAUGHT THE AAF UNPREPARED TO PROVIDE AIR-TO-GROUND OPERATIONS TO SUPPORT THE ARMY. HENCE, THE NAAF HAD TO RETRAIN ITS FIGHTER PILOTS TO FULFILL THE FIGHTER-BOMBER ROLE LEFT OPEN BY A SHORTAGE IN ATTACK AIRCRAFT AVAILABLE TO THE NAAF.⁶⁵

WHILE THE FACT THAT US PURSUIT PILOTS LACKED TRAINING FOR SOME OF THEIR ACQUIRED MISSIONS DETRACTED FROM THE NAAF’S EFFECTIVENESS, THE TRULY LIMITING FACTOR WAS THE FAILURE TO GAIN AIR SUPERIORITY BEFORE TRANSITIONING TO SUPPORTING THE ARMY. GENERAL MOMYER, WHO COMMANDED THE 33RD PG IN NORTH AFRICA, NOTED THE CONSEQUENCE IN NORTHWEST AFRICA FOR THE RAF AND AAF, “BOTH OF THESE AIR FORCES WERE TRYING TO PROVIDE CLOSE AIR SUPPORT BEFORE OBTAINING AIR SUPERIORITY... IRONICALLY—BUT NATURALLY—NOT ONLY HAD ALLIED AIRPOWER FAILED TO ACHIEVE AIR SUPERIORITY, BUT THEY HAD FAILED TO PROVIDE THE CLOSE AIR SUPPORT THAT THE COMMANDING GENERAL OF THE 1ST ARMY AND II CORPS HAD DESIRED.”⁶⁶

THE LACK OF AIR SUPERIORITY IN NORTH AFRICA WAS DIRECTLY ATTRIBUTABLE TO AAF DOCTRINE. SPECIFICALLY, THE CONCEPT THAT AIR SUPERIORITY CAN AND SHOULD BE OBTAINED WAS ABSENT FROM USAAF TEACHINGS AND DOCTRINE. FOR INSTANCE, ACTS RECOGNIZED THE VALUE OF AIR SUPERIORITY BUT QUESTIONED THE ABILITY TO ATTAIN IT. THE ACTS *PURSUIT AVIATION* TEXT OFFERS:

TEMPORARY AIR SUPERIORITY MAY BE GAINED IN ANY PARTICULAR SECTOR BY SUDDEN CONCENTRATIONS. AIR SUPERIORITY OVER THE ENTIRE FRONT WILL BE OBTAINED ONLY AFTER THE DECISIVE DEFEAT OF THE ENEMY PURSUIT FORCE. THE AMOUNT OF PURSUIT

⁶² ACTS, *Pursuit Aviation*, September 1939, 103, 107.

⁶³ Ibid., 106.

⁶⁴ FM 1-5, 15 April 1940, 42.

⁶⁵ Mets, “A Glider in the Propwash,” 58-59.

⁶⁶ General William W. Momyer, *Air Power in Three Wars (WWII, Korea, Vietnam)* (Maxwell AFB, Ala.: Air University Press, 2003), 44.

NECESSARY TO ACCOMPLISH THIS OBJECTIVE MIGHT BE TREMENDOUS AND SUCH MEASURES WILL NOT ORDINARILY BE RESORTED TO EXCEPT WHEN THIS PHASE OF COMBAT IS OF UTMOST IMPORTANCE TO THE SUCCESS OF GROUND ARMS.⁶⁷

FM 1-5 RECOGNIZED THE SAME LIMITATIONS AS THE ACTS TEXT BUT DEEMS SUCH AN EFFORT AS "SELDOM PRACTICABLE" AND FURTHER NOTES, "THE IMPRACTICABILITY OF GAINING COMPLETE CONTROL OF THE AIR NECESSITATES THE CONSTANT MAINTENANCE OF ANTI-AIRCRAFT DEFENSES TO LIMIT THE EFFECTIVENESS OF ENEMY AIR OPERATIONS." FM 1-5 ELABORATED FURTHER, HIGHLIGHTING THE CRUX OF THE PROBLEM. "THE PROBABILITY THAT ENEMY AIR OPERATIONS WILL BE ENTIRELY DENIED DUE TO LOSSES INFLICTED BY ACTIVE DEFENSES IS EXTREMELY REMOTE. THE ACTIVE DEFENSES WILL RARELY BE STRONG ENOUGH AT ANY ONE POINT TO INSURE THE COMPLETE SECURITY OF THAT POINT."⁶⁸ THE NET EFFECT LED TO AN OVER-ARCHING MINDSET OF PURSUIT AVIATORS THAT IN SUPPORT OF GROUND FORCES ON A FRONT, SINCE TOTAL AIR SUPERIORITY WAS IMPRACTICAL, THE PRIMARY ROLE FOR PURSUIT WAS ANTI-AIRCRAFT DEFENSE. THAT MISSION CLOSELY ALIGNED WITH THE DEFENSIVE PARADIGM CREATED IN THE 1930S WHEN THE ROLE OF PURSUIT AVIATION DEVOLVED TO HEMISPHERIC DEFENSE.

THAT DEFENSIVE MINDSET HAMSTRUNG PURSUIT'S EMPLOYMENT IN THE EARLY STAGES OF THE NORTH AFRICAN CAMPAIGN. DURING THE WINTER CAMPAIGN FROM NOVEMBER 1942 TO FEBRUARY 1943, AS THE US FIFTH ARMY AND BRITISH EIGHTH ARMY PUSHED EAST TOWARDS TUNISIA, THE PURSUIT PILOTS OF THE NAAF MAINTAINED A DEFENSIVE POSTURE. FM 1-5 SUMMARIZED THE THREE PURSUIT TECHNIQUES IN ORDER OF PREFERENCE NECESSARY TO ACHIEVE AN EFFECTIVE DEFENSE. THEY WERE GROUND ALERT, AIR ALERT, AND FINALLY DEFENSIVE PATROLS. THE MOST EFFECTIVE BEING GROUND ALERT AND THE LEAST EFFECTIVE DEFENSIVE PATROL BECAUSE "THE AIRCRAFT OF THE OBSERVING SCREEN ARE SO DISPERSED AS TO MAKE IT IMPRACTICABLE TO ASSEMBLE AN APPROPRIATE COMBAT FORCE IN THE EVENT AN ENEMY FORMATION IS DISCOVERED."⁶⁹ UNFORTUNATELY, THE DEFENSIVE POSTURE AIRMEN CHOSE TO ADOPT IN NORTHWEST AFRICA WAS DEFENSIVE PATROLS.

THE MAJOR LIMITATION OF BOTH GROUND AND AIR ALERT IS RECEIVING TIMELY EARLY WARNING OF AN ENEMY ATTACK THROUGH AN EFFECTIVE AIRCRAFT WARNING SERVICE.⁷⁰ THE REALITIES OF NORTH AFRICA, HOWEVER, LIMITED THE EFFECTIVENESS OF THE AIRCRAFT WARNING SERVICE. BECAUSE THE NAAF LACKED EFFECTIVE RADAR, PURSUIT PILOTS, IN ACCORDANCE WITH DOCTRINE, CHOSE TO FLY DEFENSIVE UMBRELLA PATROLS TO PROTECT THE GROUND FORCES. THE AIRFIELD AT THELEPTE, TUNISIA, WHERE THE 33RD FIGHTER GROUP OPERATED, IS A GOOD EXAMPLE. INITIALLY, "THE ABSENCE OF RADAR PERMITTED JU-88S TO ARRIVE OVER THE FIELD, DO THEIR DAMAGE, AND SCOOT BACK IN THE DIRECTION OF THEIR BASES BEFORE P-40S COULD LAUNCH AND CLIMB TO ALTITUDE.... THE ALTERNATIVE, STANDING PATROLS OVER THE BASE, WOULD WEAR DOWN OUR FORCES AND GUARANTEE THAT THEY WOULD BE OUTNUMBERED WHEN THE ATTACK CAME."⁷¹ THE INCORPORATION OF RADAR OFFERED SOME HELP, BUT THE "EARLY RADAR SETS WERE ALMOST USELESS IN THE MOUNTAINOUS TERRAIN OF NORTHERN AND CENTRAL TUNISIA."⁷² AS A RESULT, PURSUIT PILOTS OF THE TWELFTH AF WERE HEAVILY TASKED TRYING TO PROVIDE UMBRELLA COVERAGE, WHILE AT THE SAME TIME ESCORTING ATTACK AIRCRAFT AND ATTACKING GROUND TARGETS. AT ONE POINT, TWELFTH AF RESORTED TO USING P-38S FROM THE 14TH FIGHTER GROUP AT YOKUS-LES-BAINS, A MORE SECURE BASE, TO FLY DEFENSIVE PATROLS FOR THE 33RD FIGHTER GROUP AT THELEPTE TO PROTECT IT FROM SURPRISE ATTACK.⁷³

THE DOWNSIDE OF PROVIDING AN UMBRELLA DEFENSE WAS TWOFOLD. FIRST, AS DEMONSTRATED IN WORLD WAR I, DEFENSIVE PATROLS, WHICH ATTEMPTED TO COVER THE ENTIRE FRONT WERE WEAK EVERYWHERE. TO GAIN A DECISIVE ADVANTAGE, PURSUIT NEEDED TO MASS, AND THE OFFENSIVE GUARANTEED THE ABILITY TO MASS. THE SECOND AND LARGER PROBLEM WAS THAT THE CURRENT DEFENSIVE PATROLS PROVIDED NO MEANS TO GAIN AIR SUPERIORITY. AIRMEN ACCEPTED THE NOTION THAT COMPLETE AIR SUPERIORITY WAS UNTENABLE AND THEREFORE TOOK NO STEPS TO ATTAIN ANY MEASURE OF IT. BRIG GEN MONRO MACCLOSKEY, A STAFF OFFICER FOR BOTH THE TWELFTH AIR

⁶⁷ ACTS, *Pursuit Aviation*, September 1939, 105.

⁶⁸ FM 1-5, 15 April 1940, 9, 15.

⁶⁹ Ibid., 9, 40.

⁷⁰ Ibid., 9, 40.

⁷¹ Mets, "A Glider in the Propwash," 67.

⁷² Perret, 191.

⁷³ Craven and Cate, *Europe: Torch to Point Blank*, 143 and Perret, 192.

FORCE AND THE NAAF, NOTED THAT ALLIED PURSUIT EFFORTS WERE NOT LEADING TO AIR SUPERIORITY. HE SURMISED, "ALLIED LOSSES PROVIDED AMPLE EVIDENCE, HOWEVER, THAT ALLIED TACTICS WERE NOT APPRECIABLY AFFECTING THE ENEMY'S CONTROL OF THE AIR."⁷⁴

ONLY A CHANGE IN LEADERSHIP ENABLED THE NAAF TO OVERCOME ITS DEFENSIVE MINDSET. IN FEBRUARY OF 1943, A SHAKEUP OF THE NAAF'S COMMAND PAVED THE WAY FOR A RENEWED FOCUS FOR PURSUIT PILOTS FROM DEFENSE TO OFFENSE. ON 17 FEBRUARY, AIR MARSHAL SIR ARTHUR CONINGHAM TOOK CHARGE OF THE NEWLY ACTIVATED NORTHWEST AFRICAN TACTICAL AIR FORCES (NATAF). HE BROUGHT A FRESH LOOK WITH HIM AND SET OUT TO ATTAIN AIR SUPERIORITY. AS A BRITISH OFFICER, HIS SERVICE HAD A MUCH CLEARER DEFINITION OF AIR SUPERIORITY AND HIS EXPERIENCES FIGHTING ROMMEL'S FORCES IN THE DESERT AIR FORCE LED HIM TO UNDERSTAND THE NECESSITY OF GAINING AIR SUPERIORITY.⁷⁵ ON 18 FEBRUARY, HE TOLD HIS AIR COMMANDS, TO ABANDON THE AIR UMBRELLAS. "HEREAFTER," HE TOLD THEM, "THE MAXIMUM OFFENSIVE ROLE WOULD BE ASSIGNED TO EVERY MISSION... AN AIR FORCE ON THE OFFENSIVE AUTOMATICALLY PROTECTED THE GROUND FORCES."⁷⁶

CONINGHAM'S SHIFT IN FOCUS CHANGED THE AIR WAR. UMBRELLA PATROLS CHANGED TO FIGHTER-BOMBER ATTACKS ON ENEMY AIRFIELDS, FIGHTER SWEEPS, AND GROUND ATTACK ONLY AS TARGETS OF OPPORTUNITY PRESENTED THEMSELVES. THE ATTACKS KEPT "THE ENEMY BUSY AT HIS HOME AIRFIELDS" AND ALLOWED THE ALLIED AIR FORCES TO GAIN AIR SUPERIORITY. THE GROUND FORCES UNDER PATTON INITIALLY COMPLAINED ABOUT THE LOSS OF AIR COVER, BUT CONINGHAM DID NOT SWAY FROM HIS PATH OF CONTAINING THE ENEMY AT HIS AIRFIELDS AND RUNNING FORWARD AREA SWEEPS. EVENTS ON 3 APRIL VINDICATED CONINGHAM'S TACTICS WHEN 12TH AF SPITFIRES SHOT DOWN 14 STUKA DIVE-BOMBERS, A PERSISTENT SCOURGE TO GROUND FORCES. IN RESPONSE, GERMANY REMOVED ALL ITS STUKAS FROM THE THEATER, SCORING A MAJOR VICTORY FOR PURSUIT. THE OFFENSIVE TACTICS, AIDED BY EVER-INCREASING ALLIED FORCES AND EQUIPMENT, ENABLED THE ALLIES TO OBTAIN AIR SUPERIORITY BY DECISIVELY DEFEATING THE OPPOSING FORCE RATHER THAN DEFENDING AGAINST ITS ATTACKS.⁷⁷ UNFORTUNATELY, US FORCES DID NOT GRASP THAT TACTIC AS FEASIBLE UNTIL CONINGHAM'S ARRIVAL.

THE PURSUIT EXPERIENCE SUPPORTING GROUND TROOPS IN NORTH AFRICA WAS DISTILLED INTO THE 21 JULY 1943, FM 100-20 *COMMAND AND EMPLOYMENT OF AIR POWER*. IT SHOUTS IN CAPITAL LETTERS,

THE GAINING OF AIR SUPERIORITY IS THE FIRST REQUIREMENT FOR THE SUCCESS OF ANY MAJOR LAND OPERATION... THEREFORE, AIR FORCES MUST BE EMPLOYED PRIMARILY AGAINST THE ENEMY'S AIR FORCES UNTIL AIR SUPERIORITY IS OBTAINED. IN THIS WAY ONLY CAN DESTRUCTIVE AND DEMORALIZING AIR ATTACKS AGAINST LAND FORCES BE MINIMIZED AND THE INHERENT MOBILITY OF MODERN LAND AND AIR FORCES BE EXPLOITED TO THE FULLEST (EMPHASIS IN ORIGINAL).⁷⁸

CLEARLY STATING THE IMPORTANCE OF AIR SUPERIORITY, FM100-20 WAS A RETURN IN FORM TO ALMOST EXACTLY TO THE DOCTRINE AND GUIDANCE PUBLISHED IN THE 1920S. CLEARLY, AIRMEN WERE BLINDED IN THE 1930S BY NEW TECHNOLOGY THAT SEEMED TO BYPASS PURSUIT AIRCRAFT AND AIR SUPERIORITY. THE EXPERIENCES IN NORTH AFRICA TAUGHT THEM OTHERWISE.

OVERALL, PURSUIT PERFORMANCE TURNED IN A MIXED RECORD IN NORTH AFRICA. ON THE ONE HAND, PURSUIT AIRMEN PROVED THE ABILITY TO EASILY ADAPT TO NEW MISSIONS. THEIR EQUIPMENT AND TRAINING ALLOWED THEM TO ACCOMPLISH BOTH ESCORT AND GROUND ATTACK EFFECTIVELY WITH LITTLE OR NO PRIOR TRAINING. ON THE OTHER HAND, PURSUIT FALTERED IN ITS DOCTRINE. DURING THE INTERWAR YEARS, THE AIR CORPS ALLOWED A DEFENSIVE MINDSET TO OVERWHELM THE NEED FOR AIR

⁷⁴ MacCloskey, *Torch*, 162.

⁷⁵ Leonard Baker and B. F. Cooling, "Developments and Lessons Before World War II," in *Case Studies in the Achievement of Air Superiority*, ed. Benjamin Franklin Cooling (Washington, D.C.: Government Printing Office, 1994), 52 and Perret, 193.

⁷⁶ Craven and Cate, *Europe: Torch to Point Blank*, 157.

⁷⁷ Craven and Cate, *Europe: Torch to Point Blank*, 174-177, quote on 179 and Perret, 195.

⁷⁸ Field Service Regulation, FM 100-20, *Command and Employment of Air Power*, 21 July 1943, 1, AFHRA K170.121020-100.

SUPERIORITY. ONLY THE FRESH LOOK BROUGHT BY CONINGHAM ENABLED THE NAAF TO BREAK FROM THE CONSTRAINING DOCTRINE AND FIGHT FOR CONTROL OF THE AIR. IN DOING SO, THEY PROVED ONCE AGAIN THAT AIR SUPERIORITY WAS NECESSARY FOR BOTH GROUND AND AIR ACTION—A LESSON THAT AIRMEN HAD TO RELEARN IN NORTHERN EUROPE AS WELL.

Northern Europe

THE PERFORMANCE OF PURSUIT OPERATIONS IN NORTHERN EUROPE HIGHLIGHTS TWO ADDITIONAL SHORTCOMINGS OF INTERWAR PURSUIT AVIATION. FIRST, PURSUIT DEVELOPMENT FAILED TO PROVIDE AN ADEQUATE LONG-RANGE FIGHTER TO ESCORT STRATEGIC BOMBING MISSIONS INTO GERMANY. THE LACK OF AN ESCORT PLANE BECAME OVERWHELMINGLY OBVIOUS ON THE UNESCORTED BOMBING MISSIONS TO SCHWEINFURT AND REGENSBURG ON 17 AUGUST 1943 AND AGAIN TO SCHWEINFURT ON 14 OCTOBER 1943. UNACCEPTABLE LOSSES ON THOSE RAIDS, 60 OUT OF 376 B-17S LAUNCHED ON THE AUGUST RAID AND 60 OUT OF 291 LAUNCHED ON THE OCTOBER RAID, PROVED TO BE THE COUP DE GRACE TO UNESCORTED BOMBING MISSIONS.⁷⁹ AS THE AIR FORCE HISTORIANS NOTE, "THE FACT WAS THAT THE EIGHTH AIR FORCE HAD FOR THE TIME BEING LOST AIR SUPERIORITY OVER GERMANY. AND IT WAS OBVIOUS THAT SUPERIORITY COULD NOT BE REGAINED UNTIL SUFFICIENT LONG-RANGE ESCORT BECAME AVAILABLE."⁸⁰ THE HISTORIANS MISSED THE MARK SLIGHTLY; THE EIGHTH AIR FORCE NEVER HAD AIR SUPERIORITY OVER GERMANY. WHAT THEY HAD LOST WAS THE ABILITY TO COMPETE FOR AIR SUPERIORITY AT AN ACCEPTABLE COST. THE RESULT, HOWEVER, WAS THE SAME. THE EIGHTH AIR FORCE RESTRICTED ITS OPERATIONS OVER GERMANY UNTIL IT COULD FIELD A LONG-RANGE ESCORT TO PROTECT ITS BOMBERS.⁸¹

THE SECOND PURSUIT SHORTCOMING ILLUSTRATED BY NORTHERN EUROPEAN OPERATIONS WAS THE WAY THE AVIATORS EMPLOYED PURSUIT TO ACHIEVE AIR SUPERIORITY. WORLD WAR I DEMONSTRATED THAT THE BEST MEANS TO PROVIDE SECURITY FOR BOMBERS WAS TO GAIN AIR SUPERIORITY BY SEEKING OUT AND DESTROYING THE ENEMY PURSUIT, NOT BY PROVIDING A CLOSE DEFENSIVE SHIELD. INTERWAR THEORISTS TOOK THIS LESSON A STEP FURTHER AND SPECULATED THAT A COMBINED ATTACK WOULD PROVIDE EVEN A GREATER RESULT. THE BOMBERS AND ATTACK AIRCRAFT WOULD FORCE THE ENEMY FIGHTERS INTO THE AIR, WHERE FRIENDLY FIGHTERS OPERATING OFFENSIVELY COULD DESTROY THEM. THE 1929 EXERCISES IN OHIO SEEMED TO PROVE THAT POINT DEMONSTRATING THAT A COMBINED AIR FORCE ATTACK WOULD BE UNSTOPPABLE. AIRMEN, HOWEVER, FORGOT THAT LESSON IN THE SUBSEQUENT YEARS. INSTEAD, WORLD WAR II PURSUIT INITIALLY FLEW EITHER COMPLETELY SEPARATE FIGHTER-ONLY SWEEPS OR CLOSE ESCORT FOR THE BOMBERS. WHILE CLOSE ESCORT ENABLED THEM TO PROVIDE A DEFENSIVE SHIELD AROUND THE BOMBERS, THEY DID NOT TAKE ANY ACTIONS TO GAIN AIR SUPERIORITY. ON THE OTHER HAND, FIGHTER SWEEPS AIMED AT DESTROYING ENEMY PURSUIT FAILED BECAUSE THE GERMANS CHOSE NOT TO FIGHT AGAINST THE ALLIED FIGHTERS.⁸² NOT UNTIL 1944 DID PURSUIT AIRCRAFT ABANDON CLOSE ESCORTS AND SWEEPS TO WORK IN COOPERATION WITH THE BOMBERS IN AN AERIAL OFFENSIVE AGAINST GERMAN FIGHTERS. THE NEW METHODS EMPLOYED BY AMERICAN PURSUIT HELPED DECIMATE THE LUFTWAFFE AND GAIN AIR SUPERIORITY FOR THE ALLIES.⁸³ AS IN WORLD WAR I, THE TECHNIQUE OF CLOSE SUPPORT PROVED LESS EFFECTIVE AGAIN IN WORLD WAR II. IT DEMONSTRATED THAT ESCORT'S MISSION SHOULD BE TO GAIN AIR SUPERIORITY BY DESTROYING ENEMY FIGHTERS, NOT BY SHIELDING FRIENDLY BOMBERS. BUT GERMANY PROVED ANOTHER LESSON IN AIR SUPERIORITY: PURSUIT DEPENDED ON THE INITIATIVE OF THE ENEMY TO TAKE TO THE AIR; ONLY BY WORKING IN CONJUNCTION WITH BOMBARDMENT COULD PURSUIT FIGHTERS FORCE THE GERMANS INTO THE AIR AND FORCE THEM TO FIGHT FOR AIR SUPERIORITY.

⁷⁹ Boylan, *Development of the Long-Range Escort Fighter*, 97, 100 and Craven and Cate, *Europe: Torch to Point Blank*, 683, 699-704.

⁸⁰ Craven and Cate, *Europe: Torch to Point Blank*, 705.

⁸¹ *Ibid.*, 705-706.

⁸² Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority Over Germany, 1942-1944* (Washington, D.C.: Smithsonian Institution Press, 1991), 90-91.

⁸³ Emerson, "Operation POINTBLANK," 468-469 and Boylan, *Development of the Long-Range Escort Fighter*, 242.

TO UNDERSTAND WHY THE UNITED STATES LACKED A SUITABLE ESCORT AND HOW IT FORGOT THE LESSONS FROM WORLD WAR I, ONE NEEDS TO UNDERSTAND HOW PURSUIT DOCTRINE DROVE PURSUIT DEVELOPMENT AND EXECUTION IN THE WAR. THIS SECTION WILL EXAMINE EACH SHORTCOMING INDIVIDUALLY.

Long-Range Escort Development

THE EIGHTH AIR FORCE'S USE OF UNESCORTED BOMBARDMENT IN NORTHERN EUROPE STEMMED FROM A DOCTRINAL MINDSET INGRAINED IN ITS LEADERSHIP THAT BOMBERS DID NOT NEED ESCORT AND THAT NO PURSUIT FIGHTER COULD FLY THE RANGES REQUIRED TO PERFORM BOMBER ESCORT. ALTHOUGH THE EIGHTH AIR FORCE LEADERS RECOGNIZED THE BENEFIT OF PURSUIT ESCORT, THEY WERE AMBIVALENT ABOUT ITS USAGE AND PLACED PURSUIT ESCORT LOW ON THEIR PRIORITY LIST, A MOVE THAT WOULD COME BACK TO HAUNT THEM.

NORTHERN EUROPE, IN PARTICULAR, STANDS OUT FROM THE OTHER THEATERS OF WORLD WAR II, BECAUSE IT WAS THE ONLY THEATER TO EMPLOY UNESCORTED BOMBERS EXTENSIVELY. CAMPAIGNS IN BOTH NORTH AFRICA AND THE PACIFIC USED ESCORT FIGHTERS TO ASSIST THEIR BOMBERS ON A REGULAR BASIS.⁸⁴ EVEN SO, WHILE THE EIGHTH AIR FORCE EMPLOYED UNESCORTED BOMBARDMENT IT DID NOT DISCOUNT THE POSITIVE EFFECTS OF PURSUIT ESCORT. UNTIL THE SPRING OF 1943, THE EIGHTH AIR FORCE USED BRITISH SPITFIRES, PER AN ANGLO-AMERICAN AGREEMENT, TO PROVIDE SHORT-RANGE ESCORT FOR ITS BOMBERS. THE BRITISH TYPICALLY PUT UP OVER 400 FIGHTERS TO ESCORT AMERICAN BOMBER FORMATIONS.⁸⁵ AFTER APRIL 1943, THE VIII FIGHTER COMMAND TOOK UP THE RESPONSIBILITY WITH ITS P-47S. UNFORTUNATELY, NEITHER THE BRITISH SPITFIRES NOR THE EIGHTH'S P-47S HAD THE RANGE TO ACCOMPANY THE BOMBERS DEEP INTO HOSTILE TERRITORY. HENCE, WHEN THE EIGHTH AIR FORCE DESIRED TO STRIKE TARGETS OUTSIDE OF THE RANGE OF ITS FIGHTERS, RATHER THAN ABANDON THE MISSION, IT DECIDED TO PRESS WITH DOCTRINALLY CORRECT BUT TACTICALLY UNSOUND UNESCORTED BOMBER ATTACKS.⁸⁶ MORE ACCURATELY STATED THEN, THE EIGHTH STOOD OUT BECAUSE IT OPTED TO EMPLOY BOMBERS WITHOUT **LONG-RANGE** ESCORT, NOT BECAUSE IT OPTED TO EMPLOY BOMBERS WITHOUT ESCORT ALTOGETHER.

THE LACK OF AN AIRCRAFT TO PROVIDE LONG-RANGE ESCORT ALONE DOES NOT ACCOUNT FOR THE EIGHTH AIR FORCE'S DECISION TO EMPLOY UNESCORTED BOMBARDMENT. AS EARLY AS THE MIDDLE OF 1942, THE EIGHTH AIR FORCE HAD A FIGHTER IN THEATER CAPABLE OF PROVIDING LONG-RANGE ESCORT. THAT FIGHTER WAS THE P-38. ONE OF THE MOST PROMISING FIGHTERS FOR LONG-RANGE ESCORT, THE P-38, HAD EXTERNAL DROPPABLE FUEL TANKS AVAILABLE AFTER JUNE 1942 WHEN LOCKHEED HAD ATTACHED TWO 150-GALLON EXTERNAL TANKS TO P-38S. THE TANKS ENABLED THEM TO ACHIEVE A FERRY RANGE OF 2,000 MILES AND A COMBAT RADIUS OVER 500 MILES.⁸⁷ NOTABLY, THE TWELFTH AIR FORCE IN NORTH AFRICA FOUND THE P-38S VERY VERSATILE AND USED THEM TO ESCORT ALMOST EVERY BOMBARDMENT MISSION.⁸⁸ AT THE END OF NOVEMBER 1942, BRIGADIER GENERAL DOOLITTLE NOTED HIS P-38S IN AFRICA HAD ESCORTED ALL BUT ONE OF SIXTEEN BOMBARDMENT MISSIONS. IN THE CASE OF THE ONE MISSION THEY DID NOT ESCORT, THE P-38S WERE "MUDDIED DOWN" AT THEIR AIRFIELD AND UNABLE TO FLY. NOTABLY, THE AFRICAN-BASED P-38S FLEW MANY OF THEIR ESCORT MISSIONS WITH DROPPABLE EXTERNAL TANKS. THE TANKS ENABLED THEM TO ESCORT BOMBERS TO AND FROM TARGETS OVER 400 MILES AWAY, APPROACHING THE REQUIRED ONE-WAY DISTANCE OF 560 MILES NECESSARY TO ESCORT BOMBERS FROM ENGLAND TO BERLIN AND BACK.⁸⁹

SURPRISINGLY, THE P-38S THAT FLEW IN NORTH AFRICA INITIALLY FLEW IN THE EIGHTH AIR FORCE. UNFORTUNATELY, THEY DID NOT GET A CHANCE TO PROVE THEIR WORTH IN NORTHERN EUROPE BEFORE THE AAF LEADERS TRANSFERRED THEM TO AFRICA TO SUPPORT OPERATION TORCH IN THE FALL OF 1942. THE AAF TRANSFERRED THE P-38S TO AFRICA IN PART BECAUSE THE P-38 DID NOT PERFORM WELL IN THE COLD, DAMP EUROPEAN CLIMATE OR AT THE HIGH ALTITUDES REQUIRED TO

⁸⁴ Boylan, *Development of the Long-Range Escort Fighter*, 73-75, 246.

⁸⁵ McFarland and Newton, 86-89.

⁸⁶ Ibid., 86.

⁸⁷ Boylan, *Development of the Long-Range Escort Fighter*, 51-52.

⁸⁸ Craven and Cate, *Europe: Torch to Point Blank*, 121-122.

⁸⁹ Emerson, "Operation POINTBLANK," 466 and Boylan, *Development of the Long-Range Escort Fighter*, 92.

ESCORT THE BOMBERS. AT HIGH ALTITUDES, THE P-38'S SUPERCHARGERS PROVED SUSCEPTIBLE TO ICING, AND IT HAD OIL COOLER AND CARBURETOR PROBLEMS, WHICH LED TO ENGINE FAILURES.⁹⁰ ADDITIONALLY, ALTHOUGH THE P-38 REMAINED UNTESTED IN AERIAL COMBAT, EXCEPT AGAINST A CAPTURED FW-190, EIGHTH AIR FORCE LEADERS FELT THE P-38 WAS NOT MANEUVERABLE ENOUGH TO SUCCEED AGAINST THE GERMAN ME-109 AND FW-190 FIGHTERS.⁹¹ HENCE, AAF LEADERS DID NOT CONSIDER THE P-38 A VIABLE OPTION FOR ESCORT AGAINST GERMANY AND TRANSFERRED THEM TO AFRICA WHERE THEY FELT THE P-38 WOULD STAND A BETTER CHANCE. IN PLACE OF THE P-38S, THE EIGHTH AIR FORCE TURNED TO THE EMERGING P-47 TO SOLVE ITS ESCORT PROBLEM.⁹²

UNFORTUNATELY, THE P-47 WAS AN INCOMPLETE SOLUTION. BRIG GEN FRANK O'D. HUNTER, THE COMMANDING OFFICER OF VIII FIGHTER COMMAND, FAVORED THE P-47 OVER THE P-38 BECAUSE IT WAS A BETTER DOGFIGHTER, AND HE FELT IT WAS BETTER SUITED FOR THE PITCHED AIR-TO-AIR BATTLE HE ENVISIONED OVER THE SKIES OF EUROPE.⁹³ UNFORTUNATELY, HUNTER DID NOT NEED A BETTER FIGHTER, WHAT HE NEEDED WAS A LONG-RANGE ESCORT FIGHTER. THE P-47'S RANGE WAS SIMPLY TOO SHORT. TO COMPENSATE FOR ITS SHORT LEGS, THE EIGHTH AIR FORCE ORDERED 60,000 EXTERNAL TANKS FROM THE UNITED STATES IN FEBRUARY 1943 AND AN ADDITIONAL 43,200 TANKS FROM ENGLAND IN MAY. UNFORTUNATELY, VERY FEW OF THE TANKS WERE AVAILABLE BEFORE DECEMBER OF 1943.⁹⁴

THE DELAY IN GETTING THE TANKS WAS PARTLY BECAUSE THE AAF PLACED A LOW PRIORITY ON GETTING THEM, REFLECTING THE UNDERLYING BELIEFS THAT FIGHTER ESCORT WAS NOT NECESSARY, AND THAT EVEN IF AN ESCORT DID AT SOME POINT PROVE NECESSARY, THE SINGLE ENGINE PURSUIT FIGHTER WOULD NOT SUFFICE. EAKER, AS EIGHTH AIR FORCE COMMANDER IN 1943, LISTED EXTERNAL TANKS FOR HIS PURSUIT FIGHTERS AS HIS FOURTH PRIORITY.⁹⁵ EAKER'S DECISION TO PLACE EXTERNAL TANKS AS A LOW PRIORITY REFLECTED A FAILURE OF THE AAF TO CONSIDER EXTERNAL TANKS AS A SOLUTION TO SOLVE THE ESCORT PROBLEM. NOR WAS EAKER THE ONLY ONE TO DISCOUNT THE IMPORTANCE OF EXTERNAL TANKS. IN 1938, GENERAL ARNOLD REMOVED DROPPABLE WING TANK CAPABILITY FROM THE DESIGN REQUIREMENTS OF PURSUIT AIRCRAFT. HIS FEELING WAS THAT THE ADDED WEIGHT AND DRAG WOULD SIGNIFICANTLY REDUCE PURSUIT MANEUVERABILITY AND PREVENT THEM FROM EFFECTIVELY ACCOMPLISHING THEIR MISSION.⁹⁶ FURTHER, IN A CONFERENCE ON POTENTIAL ESCORT FIGHTERS IN NOVEMBER 1942, ATTENDEES DISMISSED EXTERNAL TANKS FOR PURSUIT AS AN UNFEASIBLE OPTION BECAUSE THE FIRST ENEMY ATTACKS WOULD REQUIRE DROPPING THE TANKS AT THE COASTLINE, THUS DEFEATING THE PURPOSE OF CARRYING THEM.⁹⁷ FINALLY, EXTERNAL TANKS WERE ONLY VIABLE IF THE FIGHTERS' INTERNAL FUEL WAS SUFFICIENT TO RECOVER HOME AFTER DROPPING ITS TANKS AND ENGAGING THE ENEMY. THIS CAPABILITY TRULY DID NOT EXIST IN THE P-47. WHILE THE P-47 WITH EXTERNAL TANKS COULD STRIKE DEEP INTO GERMANY; IT COULD NOT MAKE IT TO BERLIN AND BACK. ONLY THE P-51 AND P-38 HAD ENOUGH INTERNAL FUEL TO ENABLE THEM TO RETURN FROM ESCORT MISSIONS OVER BERLIN.⁹⁸ THE END RESULT: EXTERNAL TANK PRODUCTION DID NOT RECEIVE A HIGH PRIORITY LEADING TO A LONG DELAY BEFORE TANKS WOULD BE AVAILABLE IN MASS NUMBERS.

INSTEAD, AT LEAST FOR THE FIRST PART OF 1943, EAKER'S PRIORITY WAS ON THE YB-40, A B-17 MODIFIED TO BE A CONVOY DEFENDER.⁹⁹ THE YB-40 WAS THE MATERIALIZATION OF THE MULTI-

⁹⁰ W. A. Jacobs, "Operation Overlord," in *Case Studies in the Achievement of Air Superiority*, ed. Benjamin Franklin Cooling (Washington, D.C.: Government Printing Office, 1994), 277.

⁹¹ Craven and Cate, *Europe: Torch to Point Blank*, 59, 134. Ironically, the P-38 faced the same threat in North Africa flying against Me-109Gs and FW-190s and did remarkably well because at lower altitudes where much of the African campaign was fought, the P-38 performed well. Likewise, in the Pacific, the P-38 did well against the Zero. In general, P-38 pilots felt below 20,000 feet they could handle any opposition. Jacobs, 277.

⁹² Perret, *Winged Victory*, 281-282 and Boylan, *Development of the Long-Range Escort Fighter*, 92.

⁹³ McFarland and Newton, 114.

⁹⁴ Craven and Cate, *Europe: Torch to Point Blank*, 683, 699-704.

⁹⁵ McFarland and Newton, 106.

⁹⁶ Boylan, *Development of the Long-Range Escort Fighter*, 46 and Perret, 260.

⁹⁷ *Ibid.*, 71.

⁹⁸ McFarland and Newton, 104-105.

⁹⁹ Craven and Cate, *Europe: Torch to Point Blank*, 336 and Emerson, "Operation POINTBLANK," 460-461.

ENGINE FIGHTER ESCORT OUTLINED BY AWPDP/1. IN JUNE 1943, THE EIGHTH AF STARTED TESTING THE YB-40 IN COMBAT. IN COMBAT, THE YB-40 PROVED UNTENABLE BECAUSE EVEN WITH ITS ADDED GUNS AND ARMOR, IT WAS ONLY marginally more effective than a standard B-17 against hostile pursuit and it could not keep pace with the B-17s once they dropped their payloads. By July, a little over a month after the YB-40 entered combat, the AAF canceled the program.¹⁰⁰ The YB-40 was the last in series of efforts to provide an escort with attributes similar to that of a bomber. From the exercises in the late 1920s, through the development of the XFM-1, bombardment proponents felt a bomber-like convoy defender was the best option to escort bombers. Only with the failure of the YB-40 did pursuit fighters finally gain prominence as the only viable long-range escorts. Even so, before the Eighth Air Force would wholly accept the need for pursuit escort, it had to prove unescorted bombing was unworkable.

At least through the first part of 1943, one cannot fault Eighth Air Force leaders for launching unescorted bomber raids. Prewar doctrine and plans, including AWPDP/1, accepted, if not dictated, unescorted bombing. Furthermore, results from early bomber operations in Europe supported the viability of unescorted bombing. In 1942, the Eighth Air Force bombers suffered only a 3.5 percent average loss rate on each mission. However, in the first two quarters of 1943 that rose to 5.8 and 6.5 percent, respectively. Notably, over the same period fully escorted bombers suffered a loss rate of only 1.6 percent.¹⁰¹ The crisis did not truly hit until the summer of 1943 when unescorted bomber loss rate climbed to over seven times the loss rate for escorted bomber missions, including 16 percent losses on the single Regensburg and Schweinfurt raid in August 1943.¹⁰² The rise, in part, reflected the Eighth's move to strike targets deeper within Germany, increasing the bombers' exposure to enemy fighters. Increased German emphasis against the American bombardment campaign also contributed to the rising loss rate.

The Germans undertook several actions in 1943 that specifically worked against unescorted bomber tactics. First, the Germans increased the number of defenders dedicated to the daylight campaign. From January 1943 to December 1943, the Germans increased their defenses from one fighter wing with less than 100 aircraft to eleven wings with 342 single-engine and 139 twin-engine fighters. Further, the Germans moved their fighter units away from the coast, into eastern Holland and Germany, specifically so the Germany fighters could attack the bombers after their short-range escorts had departed. Additionally, the Germans developed tactics tailored to unescorted bomber formations. They transferred heavy night fighters to daylight missions and equipped twin-engine Bf-110 and Me-410 "destroyer" fighters with additional cannons and rockets meant to disrupt American formations from outside the range of the bombers' guns. While the heavy fighters proved lethal to unescorted bomber formations, they themselves were highly vulnerable to Allied fighters, and hence were truly only effective against unescorted bombers. Finally, in October 1943, the Luftwaffe restricted German fighter attacks to the heavy bombers with instructions to her pilots to avoid Allied escorts.¹⁰³ Between the German countermeasures and increased exposure time, unescorted bombers began to fall in unacceptable numbers.

The efficacy of pursuit escort as a solution to the problem, if not already apparent, should have become obvious in the early autumn of 1943, at least before the second Schweinfurt raid. Statistics by the Eighth Air Force Operational Research Section reported that unescorted bombers suffered seven times the loss rate and two and one half times the damage rates of fully escorted bomber missions.¹⁰⁴ How then could Eaker and other AAF leaders have missed the signs that bombers needed escort and

¹⁰⁰ Craven and Cate, *Europe: Torch to Point Blank*, 674, 680 and Emerson, "Operation POINTBLANK," 461.

¹⁰¹ McFarland and Newton, 106.

¹⁰² Emerson, "Operation POINTBLANK," 461.

¹⁰³ McFarland and Newton, 118-124 and Johnson, *FT&HB*, 207.

¹⁰⁴ Emerson, "Operation POINTBLANK," 461.

PRESSED WITH THE SECOND SCHWEINFURT RAID? THE ANSWER LIES IN THE FAITH THE AAF AND EAKER HAD IN PREWAR DOCTRINE, WHICH SUPPORTED UNESCORTED BOMBARDMENT.

BECAUSE DESERTING UNESCORTED BOMBARDMENT WOULD NECESSITATE HALTING DEEP STRIKES WITHIN GERMANY, THE EIGHTH, AND EAKER IN PARTICULAR, FELT COMPELLED TO PROVE UNESCORTED BOMBARDMENT THEORY AS UNWORKABLE BEFORE ABANDONING UNESCORTED RAIDS.¹⁰⁵ SEVERAL FACTORS SLOWED THE EIGHTH'S REALIZATION THAT UNESCORTED BOMBING WAS UNTENABLE. AMONG THEM WERE THE BELIEFS THAT THE GERMANS HAD ARRAYED THEIR FIGHTERS IN A THIN BELT NEAR THE COAST, THE REPORTS THAT THE EIGHTH WAS CAUSING IRREPARABLE DESTRUCTION TO GERMAN FIGHTERS IN THE AIR, AND THE NOTION THAT A LARGE ENOUGH FORMATION COULD SELF-PROTECT.

BECAUSE THE EIGHTH AIR FORCE LEADERS ENVISIONED THE GERMAN DEFENSES AS A FIGHTER BELT NEAR THE ENGLISH CHANNEL, THEY INCORRECTLY ASSUMED THEY ONLY NEEDED A SHORT-RANGE ESCORT TO GET THE BOMBERS THROUGH A THIN BAND OF FIGHTERS NEAR THE COAST.¹⁰⁶ WHILE SOMEWHAT TRUE IN 1942, BY 1943 THE GERMANS HAD WITHDRAWN THEIR FIGHTERS INTO GERMANY TO AVOID ALLIED ESCORTS. HENCE, ENEMY FIGHTERS PATROLLED THROUGHOUT GERMAN AIRSPACE. ON THE SCHWEINFURT RAIDS, IN PARTICULAR, GERMAN FIGHTERS ATTACKED THE AMERICAN BOMBERS IN REPEATED WAVE ATTACKS ALL THE WAY TO THE TARGET AND BACK.¹⁰⁷

COMPOUNDING THE FAULTY ASSESSMENT OF GERMAN DEFENSES WAS THE INACCURACY OF THE EIGHTH'S MISSION REPORTS. DESPITE THEIR OWN LOSSES, MISSION REPORTS AND CLAIMS OF KILLS LED VIII Bomber Command to believe it was striking critical blows to the Luftwaffe. EIGHTH AIR FORCE CLAIMS IN 1943 AND 1944 AVERAGED FOUR TIMES GREATER THAN THE ACTUAL NUMBER OF GERMANS SHOT DOWN, WITH SOME MISSIONS SCORING SIGNIFICANTLY HIGHER.¹⁰⁸ FOR INSTANCE, ON THE SECOND SCHWEINFURT RAID, EIGHTH AIR FORCE GUNNERS CLAIMED 288 GERMAN FIGHTERS KILLED. THEY ACTUALLY KILLED ONLY 36 AND CAUSED THE GERMANS TO WRITE OFF AN ADDITIONAL 12.¹⁰⁹ THE INFLATED NUMBERS LED THE EIGHTH AIR FORCE TO INFER IT WAS WINNING THE AIR BATTLE. AFTER THE 14 OCTOBER SCHWEINFURT MISSION, GENERAL EAKER WROTE TO GENERAL ARNOLD THAT HE THOUGHT THE LUFTWAFFE ATTACKS WERE THE "LAST FINAL STRUGGLES OF A MONSTER IN HIS DEATH THROES... THERE [WAS] NOT THE SLIGHTEST QUESTION BUT THAT WE NOW HAVE OUR TEETH IN THE HUN AIR FORCE'S NECK."¹¹⁰ EAKER'S STATEMENT IS A BIT SHORTSIGHTED AND RINGS OF RATIONALIZATION ON HIS PART. IT IS UNFATHOMABLE TO THINK THAT EAKER TRULY BELIEVED THE AERIAL VICTORY REPORTS. IN THE WEEK PRIOR TO THE OCTOBER SCHWEINFURT RAID, THE EIGHTH CLAIMED 503 ENEMY AIRCRAFT DOWNED, A NUMBER GREATER THAN THE ACTUAL STRENGTH OF THE LUFTWAFFE DEFENSES. YET ON THE OCTOBER 14, AMERICAN PILOTS OVER SCHWEINFURT REPORTED ATTACKS BY HUNDREDS OF ENEMY FIGHTERS.¹¹¹ CLEARLY THEN, EAKER MUST HAVE KNOWN THE EIGHTH'S CLAIMS WERE HIGHLY INFLATED AND THAT THE EIGHTH BOMBERS WERE NOT STRIKING THE CRITICAL BLOW TO THE LUFTWAFFE HE HAD HOPED FOR.

ALTHOUGH EARLIER INFLATED CLAIMS MAY HAVE INCREASED THE WILLINGNESS OF THE EIGHTH TO CONTINUE TO LAUNCH UNESCORTED RAIDS, IT WAS EAKER'S THEORY THAT A LARGE NUMBER OF BOMBERS IN GOOD FORMATION COULD PROVIDE ITS OWN PROTECTION THAT CAUSED HIM TO CONTINUE PRESSING UNESCORTED RAIDS. FOR EAKER, THE MAGIC NUMBER WAS THREE HUNDRED BOMBERS. HE WRITES IN THE FALL OF 1942, "I AM ABSOLUTELY CONVINCED THAT THE FOLLOWING MEASURES ARE SOUND... THREE HUNDRED HEAVY BOMBERS CAN ATTACK ANY TARGET IN GERMANY BY DAYLIGHT WITH

¹⁰⁵ Also affecting Eaker's decision was the need to gain air superiority on the European continent for Operation Overlord. The AAF considered the factories at Schweinfurt a critical link in the German aircraft production. Hence, Eaker may have felt compelled to launch the raid; especially in light of bombardment doctrine that purported the mission would succeed with reasonable losses. McFarland and Newton, 169-172.

¹⁰⁶ Boylan, *Development of the Long-Range Escort Fighter*, 68-69.

¹⁰⁷ Craven and Cate, *Europe: Torch to Point Blank*, 685, 702.

¹⁰⁸ McFarland and Newton, 249-250.

¹⁰⁹ Perret, *Winged Victory*, 269 and Craven and Cate, *Europe: Torch to Point Blank*, 683.

¹¹⁰ Lt Gen Ira C. Eaker, quoted in David E. Johnson, *Fast Tanks and Heavy Bombers: Innovation in the US Army 1917-1945* (Ithaca, N.Y.: Cornell University Press, 1998), 210.

¹¹¹ McFarland and Newton, 129. The Germans actually launched 567 sorties, some aircraft flying two and three times.

LESS THAN FOUR PERCENT LOSSES. A SMALLER NUMBER OF BOMBERS WILL NATURALLY SUFFER HEAVIER LOSSES."¹¹² THE REPORT OF A REVIEW BOARD BY THE VIII Bomber Command in the fall of 1942 LIKewise EXPANDED ON THE VALUE OF Bomber FORMATIONS. "ONE SALIENT FACT EMERGES FROM ANY STUDY OF GERMAN FIGHTER TACTICS AGAINST MISSIONS FLOWN TO DATE: NO TACTICS HAVE BEEN EVOLVED CAPABLE OF INFLICTING UNECONOMICAL LOSSES ON UNITS OF 12 OR MORE B-17'S OR B-24'S WHEN FLOWN IN CLOSE FORMATION."¹¹³ THESE FINDINGS REINFORCED THE PREWAR MINDSET WITHIN THE EIGHTH Air Force THAT UNESCORTED BOMBARDMENT COULD SUCCEED. UNFORTUNATELY, THE EVENTS OF THE FALL 1943 PROVED OTHERWISE. THE SCHWEINFURT AND REGENSBURG DISASTERS CONFIRMED UNESCORTED BOMBARDMENT AS UNVIAble AND VAULTED PURSUIT ESCORT TO THE AAF'S NUMBER ONE PRIORITY.

Air Superiority over Germany

THE SCHWEINFURT AND REGENSBURG RAIDS CONVINCED THE AAF, AND GENERAL ARNOLD IN PARTICULAR, THAT ESCORTS WERE NECESSARY.¹¹⁴ THOSE ESCORTS WERE ONLY PART OF THE ANSWER HOWEVER. HOW THE VIII FIGHTER COMMAND USED THEM WAS EQUALLY IMPORTANT. UNDER A NEW COMMANDER, MAJOR GENERAL DOOLITTLE, THE EIGHTH'S FIGHTERS NO LONGER RESTRICTED THEMSELVES TO CLOSE ESCORT, BUT SOUGHT OUT THE GERMAN FIGHTERS IN THE AIR AND ON THE GROUND. THAT CHANGE IN OPERATIONS HELPED THE EIGHTH Air Force WREST AIR SUPERIORITY FROM THE LUFTWAFFE. WHILE THIS WAS NOT THE ONLY CHANGE THAT ENABLED THE EIGHTH TO GAIN AIR SUPERIORITY, IT STANDS OUT AS A SHIFT THE EIGHTH COULD HAVE MADE BEFORE 1944 TO IMPROVE ITS RECORD AGAINST THE GERMAN Air Force.

THE Air Force DOOLITTLE EMPLOYED IN JANUARY 1944 ONLY VAGUELY RESEMBLED EAKER'S FORCE IN OCTOBER OF 1943. EIGHTH Air Force BOMBERS HAD INCREASED FROM TWENTY-ONE TO TWENTY-SIX HEAVY Bomber GROUPS, WHILE ITS FIGHTERS HAD INCREASED FROM NINE TO SIXTEEN GROUPS, INCLUDING A LONG-RANGE P-51 GROUP AND TWO LONG-RANGE P-38 GROUPS. FURTHERMORE, ITS FIGHTERS HAD EXTERNAL TANKS THAT COULD CARRY THEM TO BERLIN AND BACK.¹¹⁵ DURING THE SAME PERIOD, THE GERMAN AIRCRAFT NUMBERS ONLY MARGINALLY INCREASED, WHILE ITS PILOTS BECAME LESS EXPERIENCED AS ATTRITION BROUGHT A GREATER NUMBER OF ILL-TRAINED PILOTS TO THE FRONT LINES. FINALLY, THE GERMANS OPTED TO TARGET THE ONLY THE BOMBERS AND SOUGHT TO AVOID AERIAL COMBAT WITH THE AMERICAN FIGHTERS WHENEVER POSSIBLE.¹¹⁶ THE COMBINATION OF CHANGES COMBINED TO ENHANCE THE EFFECTIVENESS OF DOOLITTLE'S NEW FOCUS AGAINST THE LUFTWAFFE'S FIGHTERS.

WHEN DOOLITTLE TOOK COMMAND OF THE EIGHTH Air Force, HE CHANGED THE WAY HIS FIGHTERS PROVIDED ESCORT AND WITH IT THE ENTIRE MENTALITY OF PURSUIT ESCORT. NO LONGER WERE PURSUIT ESCORTS TO PROVIDE A DEFENSIVE SHIELD FOR THE BOMBERS; INSTEAD, THEY WERE TO GAIN AIR SUPERIORITY OVER GERMANY AND PROVIDE SUPPORT BY ELIMINATING THE THREAT. GEN EARLE E. PARTRIDGE, DOOLITTLE'S CHIEF OF STAFF, RECOUNTS DOOLITTLE'S VISIT TO VIII FIGHTER COMMAND WHERE HE CHANGED THE PURSUIT PHILOSOPHY. PARTRIDGE NOTES,

THE GENERAL OVER THERE, KEPNER [BRIG GEN WILLIAM E.], WAS IN HIS OFFICE... THERE WAS A SIGN ON THE WALL WHICH SAID, "THE MISSION OF THE FIGHTERS IS TO BRING THE Bomber FORMATIONS BACK INTACT." DOOLITTLE LOOKED AT THAT AND SAID, "BILL, I WANT YOU TO TAKE THAT SIGN DOWN AND FROM NOW ON, YOU HAVE A DIFFERENT MISSION." HE SAID, "I WANT YOU TO CUT LOOSE FROM THAT Bomber STREAM. I WANT YOU TO GO FIND THE GERMAN FIGHTERS AND DESTROY THEM. YOU WILL PROTECT THE Bomber FORMATION BY DOING THAT, AND WE HAVE TO GET CONTROL OF THE AIR THAT IS ALL THERE IS TO IT."

¹¹² Lt Gen Ira C. Eaker, quoted in, Boylan, *Development of the Long-Range Escort Fighter*, 68.

¹¹³ VIII Bomber Command Report, quoted in Boylan, *Development of the Long-Range Escort Fighter*, 70.

¹¹⁴ Stephen Budiansky, *Air Power* (New York, N.Y.: Viking, 2004), 324.

¹¹⁵ McFarland and Newton, 155.

¹¹⁶ Ibid., 135-136, 171-172.

KEPNER SHUDDERED AND SAID, "OH, WE CAN'T DO THAT. WE HAVE BEEN WORKING ON A DIFFERENT THEORY ALL THE TIME. WE HAVE GIVEN CLOSE SUPPORT TO THE BOMBER STREAM, TRYING TO PREVENT IT FROM BEING ATTACKED ALONG THE WAY." HE GAVE A GREAT ARGUMENT.

DOOLITTLE SAID, "I DON'T CARE, GO AFTER THE GERMAN FIGHTERS, WHEREVER THEY ARE—ON THE GROUND, IN THE AIR, ANYPLACE."¹¹⁷

THE NEED TO CHANGE FIGHTER ESCORT TECHNIQUE WAS NOT AN ISOLATED EVENT, BUT THE CULMINATION OF A CAMPAIGN TO GAIN AIR SUPERIORITY. INITIALLY, HUNTER, AS COMMANDER OF THE VIII FIGHTER COMMAND, EMPLOYED HIS FIGHTERS SEPARATELY FROM THE BOMBERS. HE UTILIZED THEM FOR OFFENSIVE SWEEPS INTO FRANCE AND THE LOW COUNTRIES, FOLLOWING THE MODEL DEVELOPED IN AFRICA WHERE FIGHTER SWEEPS DEMONSTRATED GREAT SUCCESS.¹¹⁸ IN EUROPE, HOWEVER, THE EIGHTH HAD ALMOST NO SUCCESS WITH FIGHTER SWEEPS. UNLIKE AFRICA, THERE WAS NO GROUND OFFENSIVE TO SUPPORT IN EUROPE, HENCE THE LUFTWAFFE COULD SHY AWAY FROM HUNTER'S SWEEPS AND PREVENT HIS FIGHTERS FROM INFLECTING ANY SIGNIFICANT DAMAGE. THE LUFTWAFFE ONLY SOUGHT COMBAT WHEN BOMBERS WERE PRESENT. VIII FIGHTER COMMAND STATISTICS THROUGH MAY 1943 BEAR OUT THIS FACT. ELEVEN OF THE COMMAND'S FIFTEEN KILLS HAD COME ON ESCORT MISSIONS, YET ESCORT MISSIONS COMPRISED ONLY 10 PERCENT OF ITS SORTIES. THOSE STATISTICS, AND THE RISING CALL FOR ESCORTS, CAUSED EAKER TO DECIDE IN THE SUMMER OF 1943 TO MOVE AWAY FROM HUNTER'S SCHEME AND SHIFT THE EIGHTH'S FIGHTERS SOLELY TO CLOSE ESCORT. VIII FIGHTER COMMAND FURTHER REINED IN PURSUIT ESCORT BY DIRECTING ITS PILOTS TO STAY WITH THE BOMBERS AND "NEVER GO BELOW 18,000 FEET."¹¹⁹ WHILE THIS TECHNIQUE ENSURED THE BOMBERS MAXIMUM PROTECTION BY LIMITING PURSUIT TO DEFENSE OF THE BOMBERS, IT ALLOWED THE GERMAN FIGHTERS TO ESCAPE AMERICAN PURSUIT IF THREATENED. AS SUCH, IT DID LITTLE TO GAIN LASTING AIR SUPERIORITY OVER GERMANY. ONLY ATTRITION OF THE LUFTWAFFE COULD ACCOMPLISH THAT, AND THAT WAS WHAT DOOLITTLE SET OUT TO DO.

UNDER DOOLITTLE, PURSUIT ESCORT, FREED FROM THE BOMBER STREAM, ATTACKED THE GERMAN FIGHTERS RELENTLESSLY. THEY STRUCK THE GERMAN FIGHTERS ON THE GROUND AND IN THE AIR, EMPLOYING OFFENSIVELY TO GREAT SUCCESS. IMPORTANTLY, THEY STAYED CLOSE ENOUGH TO THE BOMBERS TO ENSURE THEY WOULD MEET THE GERMANS, BUT THEN MANEUVERED INDEPENDENTLY TO DEFEAT THE GERMAN PURSUIT. THEY INTERCEPTED THE LUFTWAFFE FIGHTERS ON THE WAY TO THE TARGET BEFORE THEY COULD GET TO THE BOMBER STREAM AND PREVENTED THE ENEMY FROM TAKING OFF ON SUBSEQUENT SORTIES BY STRAFING THE GERMAN AIRFIELDS WHEN THEY LANDED. FURTHERMORE, DETACHED ESCORT NATURALLY PAVED THE WAY FOR THE EIGHTH TO BEGIN USING FIGHTER RELAYS TO ESCORT THE BOMBERS EVEN DEEPER INTO GERMANY. RELAYS OPTIMIZED THE RANGE OF THE FIGHTERS BY FREEING THEM FROM FLYING AT BOMBER SPEEDS. THIS TECHNIQUE INCREASED THE RANGE OF THE FIGHTERS AND GAVE THEM MORE TIME TO ENGAGE THE ENEMY THEREBY FURTHER INCREASING THEIR EFFECTIVENESS.¹²⁰

ONE OF THE MAIN GOALS OF THE STRATEGIC BOMBING CAMPAIGN WAS TO GAIN AIR SUPERIORITY FOR OPERATION OVERLORD, THE ALLIED INVASION OF THE CONTINENT. OVERLORD HINGED ON GAINING AIR SUPERIORITY. OPERATION POINTBLANK WAS THE MEANS THE STRATEGIC BOMBING CAMPAIGN WOULD USE TO GAIN AIR SUPERIORITY. ITS AIM WAS TO CRIPPLE THE GERMAN LUFTWAFFE BY DESTROYING THE GERMAN AIRCRAFT INDUSTRY AND FIGHTER PRODUCTION, IN PARTICULAR. SO IMPORTANT WAS THE EFFORT TO THE GAIN AIR SUPERIORITY, THAT IN JUNE 1943, THE ALLIES RAISED POINTBLANK'S STATUS TO AN INTERMEDIATE OBJECTIVE WHOSE PRIORITY WAS SECOND TO NONE.¹²¹ THE IMPORTANCE OF POINTBLANK YIELDS SOME INSIGHT AS TO WHY THE EIGHTH AIR FORCE LEADERS MAY

¹¹⁷ Gen Earle E. Partridge, transcript of oral history interview by Tom Sturm and Hugh N. Ahmann, 23-25 April 1974, 197, AFHRA K239.0512-729.

¹¹⁸ McFarland and Newton, 88, 91.

¹¹⁹ Ibid., 99-100, 133.

¹²⁰ Relays increased the range a P-51B could escort bombers from 500 to 600 miles. McFarland and Newton, 105.

¹²¹ Jacobs, "Overlord," 280.

HAVE CONTINUED TO PRESS WITH UNESCORTED BOMBARDMENT AS LONG AS THEY DID. THEY FELT THEY HAD TO BECAUSE GAINING AIR SUPERIORITY FOR OVERLORD WAS VITALLY IMPORTANT.

BOMBARDMENT ALONE, HOWEVER, FAILED TO GAIN AIR SUPERIORITY AS PLANNED, BUT DID SERVE AS A CRITICAL ENABLER FOR ALLIED PURSUIT TO GAIN AIR SUPERIORITY. IT FORCED THE GERMAN FIGHTERS INTO THE SKY WHERE THE ALLIED PURSUIT COULD SHOOT THEM DOWN. DESTROYING THE LUFTWAFFE'S FIGHTERS ENDED UP BEING MORE IMPORTANT THAN THE BOMBARDMENT RESULTS. SPECIFICALLY, THE ALLIES GAINED AIR SUPERIORITY NOT BY REDUCING GERMAN AIRCRAFT PRODUCTION BUT BY KILLING IRREPLACEABLE LUFTWAFFE PILOTS IN THE SKIES OVER GERMANY. GERMAN FIGHTER PRODUCTION CONTINUED TO RISE THROUGH THE FIRST SIX MONTHS OF 1944 ENABLING THEM TO REPLACE LOST AIRCRAFT, BUT THEY WERE UNABLE TO REPLACE PILOTS LOST IN AIR-TO-AIR COMBAT.¹²² THUS, IN GAINING AIR SUPERIORITY, THE VIII FIGHTER COMMAND SUCCEEDED WHERE THE BOMBERS HAD FAILED. THEIR SUCCESS WAS IN NO SMALL PART DUE TO THE CHANGE IN MENTALITY BROUGHT BY DOOLITTLE. HIS CHANGE CONVERTED VIII FIGHTER COMMAND'S EMPLOYMENT FROM DEFENSIVE ESCORT INTO OFFENSIVE ATTACKS AIMED AT ATTRITION OF THE ENEMY.¹²³ IT REVERTED THE EMPLOYMENT OF THE FIGHTERS TO TECHNIQUES DISCOVERED IN WORLD WAR I BUT FORGOTTEN BETWEEN THE WARS.

ONE OF THE REASONS WHY PURSUIT FORGOT AIR SUPERIORITY LESSONS IN THE INTERWAR ERA WAS ATTRIBUTABLE TO THE RISE OF THE BOMBER. SPECIFICALLY, BOMBARDMENT BECAME THE MEANS TO ACQUIRE AIR SUPERIORITY WHILE PURSUIT BECAME PURELY A DEFENSIVE FORCE. AS SUCH, AIRMEN GAVE PURSUIT ONLY A SECONDARY ROLE TOWARDS GAINING AIR SUPERIORITY. THE AIR CORPS BOARD STUDY NO. 35, "EMPLOYMENT OF AIRCRAFT IN DEFENSE OF THE CONTINENTAL UNITED STATES," NOTES THE LIMITATION OF PURSUIT ON DEFENSE. "ANTIAIRCRAFT DEFENSE IS A DIRECT DEFENSE ONLY AND RESULTS IN ATTRITION TO THE ENEMY AIR FORCE IN PROPORTION TO ITS EFFICIENCY AND THE FREQUENCY WITH WHICH THE ENEMY COMES WITHIN ITS ZONE OF INFLUENCE. ANTIAIRCRAFT DEFENSE ALONE NEVER CAN DEFEAT OR NEUTRALIZE A HOSTILE AIR FORCE."¹²⁴ MAJ FREDERICK M. HOPKINS, ACTS INSTRUCTOR 1939-40, EXPLAINED THIS LINE OF REASONING IN A 1939 AIR CORPS TACTICAL SCHOOL LECTURE. HE OUTLINED THE IMPRACTICALITY OF USING PURSUIT DEFENSE TO STOP ENEMY ATTACKS. INSTEAD, THE GENERALLY ACCEPTED ACTS SOLUTION WAS THAT THE BEST DEFENSE AGAINST ENEMY AIRCRAFT WAS TO ATTACK THEM AT THEIR BASES WITH FRIENDLY BOMBERS.¹²⁵ THUS, PURSUIT NOT ONLY ADOPTED A DEFENSIVE ROLE, BUT ALSO COMPLETELY CEDED OFFENSIVE ACTION TO THE BOMBERS. MIRED IN A DEFENSIVE MINDSET, PURSUIT LOST ITS FOCUS ON BOTH OFFENSIVE ACTION AND AIR SUPERIORITY. ITS PRIORITIES SHIFTED FROM DESTROYING ENEMY PURSUIT TO HINDERING ENEMY BOMBARDMENT. IN SHORT, AIRMEN FORGOT PURSUIT'S VITAL ROLE IN GAINING AIR SUPERIORITY.

THE CHANGES IN ESCORT DOCTRINE FROM THE END OF WORLD WAR I TO THE START OF WORLD WAR II CLEARLY REFLECT THE DECLINE OF AIR SUPERIORITY THOUGHT IN THE PURSUIT COMMUNITY. BY THE END OF WORLD WAR I, AVIATORS HAD DISCOVERED THAT PURSUIT WAS MOST EFFECTIVE ON THE OFFENSE. AS SUCH, IT PROVIDED THE BEST SUPPORT TO BOMBERS WHEN OPERATING IN DETACHED SUPPORT OF THE BOMBERS. THROUGH DETACHED SUPPORT, THEY WERE ABLE TO GAIN LOCAL AIR SUPERIORITY ON THEIR TERMS, INDIRECTLY PROTECTING THE BOMBERS.¹²⁶ WITH THE RISE OF THE BOMBER IN THE EARLY THIRTIES, HOWEVER, PURSUIT LOST ITS ESCORT MISSION AND FORGOT HOW BEST TO ESCORT. THAT LOSS OF MISSION IS EVIDENT IN THE AIR CORPS DOCTRINE IN THE 1930S.

¹²² McFarland and Newton, 171, 190.

¹²³ Emerson, "Operation POINTBLANK," 467-468 and Boylan, *Development of the Long-Range Escort Fighter*, 242.

¹²⁴ Air Corps Board, "Study No. 35: Employment of Aircraft in Defense of the Continental United States" (Maxwell Field, Ala., 7 May 1939), annex II, 5, AFHRA 167.5-35.

¹²⁵ Greer, *The Development of Air Doctrine*, 115. Note: AWPDP/1 thought Germany had too many well dispersed and defended airfields to employ friendly bombers against them effectively. It notes, "It seems improbable that the German Fighter Command can be neutralized by air attack of its bases." Hence, its target set for gaining air superiority shifted from airfields to the factories that built fighters. AWPDP/1, "Munitions," Tab 1, 8.

¹²⁶ Maj Thomas DeW. Milling, Air Service Field Officers' School TR 440-15, *Air Tactics*, 1922, 10-12, AFHRA 248.101-4A and William C. Sherman, *Air Warfare* (1926, reprint Maxwell AFB, Ala.: Air University Press, 2002), 123-124.

THE ACTS *PURSUIT TEXT* OF 1933 ACKNOWLEDGED BOTH GENERAL (DETACHED) AND SPECIAL (CLOSE) SUPPORT MISSIONS. THE TEXT FAVORED GENERAL SUPPORT. IT NOTED THAT GENERAL SUPPORT, CONDUCTED THROUGH “THE NORMAL OFFENSIVE OPERATIONS OF PURSUIT SHOULD PROVIDE SUFFICIENT PROTECTION FOR OTHER AIR FORCES.” HOWEVER, THE TEXT ALSO RECOGNIZED THAT WHEN REQUIRED, “PURSUIT WILL COOPERATE WITH BOMBARDMENT AND ATTACK AVIATION IN CARRYING A VIGOROUS OFFENSIVE INTO HOSTILE TERRITORY.”¹²⁷ THE 1933 TEXT DID NOT ELABORATE ANY FURTHER ON THE ESCORT ROLE FOR PURSUIT BUT DID RECOGNIZE AIR SUPREMACY AS AN ATTAINABLE GOAL. IT NOTED, “THE MISSION OF PURSUIT AVIATION IS TO DESTROY HOSTILE AIRCRAFT. THE DESTRUCTION OF HOSTILE AIRCRAFT IN FLIGHT CONTRIBUTES TO THE ATTAINMENT OF AERIAL SUPREMACY AND SUPPORTS THE OPERATIONS OF OUR AIR AND GROUND FORCES... HOSTILE AIRCRAFT MUST BE SOUGHT OUT AND DESTROYED WHEREVER FOUND.” IT FURTHER ACKNOWLEDGED ITS PRIMARY TARGET WAS ENEMY PURSUIT, STATING, “NORMALLY, THE FIRST AIM OF PURSUIT AVIATION IS TO ENGAGE AND DEFEAT THE HOSTILE PURSUIT FORCES.”¹²⁸ HENCE, IN 1933, PURSUIT THOUGHT AT ACTS STILL REFLECTED MANY OF THE LESSONS LEARNED FROM WORLD WAR I. IT STILL ADVOCATED WINNING AIR SUPERIORITY THROUGH OFFENSIVE ACTION. ONE CANNOT SAY THE SAME ABOUT THE PURSUIT DOCTRINE THAT FOLLOWED IN THE LATE 1930S.

THE SEPTEMBER 1939 ACTS TEXT *PURSUIT AVIATION* BEGAN ITS DISCUSSION ON ESCORT STATING, “THE FIRST PRIORITY MISSION OF PURSUIT, ACTING IN A DEFENSIVE OR PROTECTIVE ROLE, IS TO FURNISH PROTECTION FOR THE STRIKING AND INTELLIGENCE-GATHERING AVIATION BRANCHES, BOMBARDMENT, ATTACK, AND OBSERVATION.”¹²⁹ THE STATEMENT, FOCUSED ON PROTECTING OTHER AIRCRAFT, IS VAGUELY SIMILAR TO THE VIII FIGHTER COMMAND SIGN THAT DOOLITTLE HAD REMOVED. THE TEXT INDICATES A SUBTLE SHIFT TOWARDS DEFENSIVE PROTECTION VICE OFFENSIVE OPERATIONS. ELSEWHERE, THE TEXT OUTRIGHT DECLARES PURSUIT IS DEFENSIVE IN NATURE STATING, “PURSUIT... UNABLE TO SEEK OUT AND DESTROY THE ENEMY MUST CONFINE ITSELF TO DENYING THE ENEMY FREEDOM OF ACTION WITHIN ITS ZONE. IN A WORD IT BECOMES DEFENSIVE.”¹³⁰ IN TERMS OF ESCORT, THE TEXT MAINTAINS A DEFENSIVE TONE, RECOGNIZING, LIKE THE 1933 TEXT, BOTH GENERAL AND SPECIAL SUPPORT FOR AS VIABLE ESCORT TECHNIQUES. THE 1939 PURSUIT TEXT, HOWEVER, DISPLAYS NO PREFERENCE FOR ONE OVER THE OTHER, AND MORE IMPORTANTLY DEFERS THE DECISION FOR TYPE OF SUPPORT TO THE BOMBARDMENT COMMANDER.¹³¹ THE DECEMBER 1939 ACTS LECTURE “PURSUIT IN SUPPORT OF THE AIR FORCE,” IS NOT SO AMBIVALENT, IT NOTES THAT PURSUIT WOULD PREFER TO PROVIDE GENERAL SUPPORT, BUT STATES, “IT SHOULD BE OBVIOUS THAT THE METHOD OF FURNISHING SPECIAL SUPPORT IS THE ONE WHICH THE SUPPORTED COMMANDER WOULD PREFER. IT GIVES HIM THE BEST PROTECTION FOR THE AMOUNT OF PURSUIT INVOLVED.”¹³² WHILE THE 1939 ACTS TEACHINGS RETAIN FAINT TRACES OF THE TECHNIQUES DESCRIBED IN EARLIER DOCUMENTS, FM 1-5 PUBLISHED THE FOLLOWING YEAR REMOVED THOSE TRACES AND OUTLINED TACTICS SIMILAR TO THOSE EMPLOYED IN NORTHERN EUROPE UNDER GENERAL EAKER.

FM 1-5, *EMPLOYMENT OF AVIATION OF THE ARMY*, IDENTIFIES ACCOMPANYING SUPPORT AND GENERAL SUPPORT AS THE TWO METHODS OF SUPPORTING BOMBARDMENT AVIATION. DEFINING ACCOMPANYING SUPPORT, IT NOTES, “THE ONLY METHOD BY WHICH PURSUIT FORCES ARE ABLE TO PROVIDE CLOSE PROTECTION FOR AIRCRAFT IN FLIGHT IS BY ACCOMPANYING THOSE AIRCRAFT AND ENGAGING ANY AND ALL ENEMY AIRCRAFT WHICH THREATEN THE SECURITY OF THE FRIENDLY FORMATION.” IN CONTRAST, IT NOTES, OFFENSIVE PATROLS PROVIDE GENERAL SUPPORT. FM 1-5, HOWEVER, CAUTIONS AGAINST GENERAL SUPPORT STATING, “THE EMPLOYMENT OF PURSUIT FORCES ON OFFENSIVE PATROL REQUIRES THE USE OF LARGE PURSUIT FORCES, AND IS RELATIVELY INEFFICIENT. SUCH EMPLOYMENT IS RESORTED TO ONLY WHEN SEVERAL IMPORTANT AIR OPERATIONS ARE CONDUCTED CONCURRENTLY WITHIN A SMALL AREA FOR A SHORT TIME.”¹³³ ADDITIONALLY, AS NOTED

¹²⁷ ACTS, *Pursuit Aviation*, (Maxwell Field, Ala.: Air Corps Tactical School, February 1933), 48.

¹²⁸ Ibid., 48, 52.

¹²⁹ ACTS, *Pursuit Aviation*, (Maxwell Field, Ala.: Air Corps Tactical School, September 1939), 67.

¹³⁰ Ibid., 65.

¹³¹ Ibid., 68.

¹³² Capt E. E Partridge, “Pursuit in Support of the Air Force,” lecture, ACTS, Maxwell Field, Ala., 13 December 1938, 12, AFHRA 248.2808-17.

¹³³ FM 1-5, 15 April 1940, 40-41. Ironically, in escort operations in Africa, P-38s flew defensively as close escort only when they greatly outnumbered the enemy. When the Germans fighters outnumbered the P-

EARLIER REGARDING NORTH AFRICAN OPERATIONS, SPECIFICALLY LACKING FROM FM 1-5 WAS THE NOTION OF AIR SUPERIORITY. FM 1-5 ONLY MENTIONED AIR SUPERIORITY BY NOTING, "COMPLETE CONTROL OF THE AIR... IS SELDOM PRACTICABLE."¹³⁴

FROM WORLD WAR I TO FM 1-5, PURSUIT SUFFERED A SLOW DECAY FROM OFFENSIVE TO DEFENSIVE. THAT DEFENSIVE MINDSET HAMSTRUNG THE PURSUIT PILOTS. THE VERY NATURE OF THEIR DEFENSIVE ROLE ALLOWED AIRMEN TO FORGET THE IMPORTANCE OF AIR SUPERIORITY. THEY FORGOT AIR SUPERIORITY BOTH IN TERMS OF SUPPORTING GROUND TROOPS AND IN TERMS OF PROTECTING AIRBORNE ASSETS. AS A RESULT, THE PURSUIT AVIATORS FOCUSED ON DEFENDING FRIENDLY GROUND AND AIR FORCES, RATHER THAN OFFENSIVELY DESTROYING THE ENEMY THAT THREATENED WHAT THEY WERE DEFENDING. PILOTS HAD PROVEN PURSUIT MOST EFFECTIVE ON THE OFFENSE, YET AT THE START OF WORLD WAR II, PURSUIT WAS UNPREPARED TO EMPLOY OFFENSIVELY. AS SUCH, PURSUITERS HAD TO RELEARN THE LESSONS FROM WORLD WAR I AS PURSUIT EMPLOYMENT ADAPTED TO THE UNFORESEEN MISSIONS DEMANDED BY WORLD WAR II.

38s, the P-38s flew offensive sweeps ahead of the bombers allowing the P-38s the ability to disrupt the German attacks while giving them the maximum capability to defend themselves. Boylan, *Development of the Long-Range Escort Fighter*, 75.

¹³⁴ FM 1-5, 15 April 1940, 9.

Conclusion

WHEN THE PURSUIT TYPE AIRPLANE, BECAUSE OF ITS SIZE, POWER PLANT, AND GENERAL DESIGN, BECOMES SUITABLE FOR USE BY OTHER BRANCHES SUCH AS ATTACK, OBSERVATION, AND LIGHT BOMBARDMENT, WITH SLIGHT CHANGES IN EQUIPMENT INVOLVING NO LOSS OF SPEED, PURSUIT AVIATION WILL HAVE LOST ITS FUNCTIONAL REASONS FOR EXISTENCE... THE BATTLE FOR AERIAL SUPREMACY WILL ASSUME A DIFFERENT COMPLEXION AND WILL BE FOUGHT ON NEW LINES.

- PURSUIT AVIATION, ACTS 1933

UNITED STATES PURSUIT AVIATION ENTERED WORLD WAR II UNREADY TO COMPETE WITH THE OTHER MAJOR POWERS. ITS EQUIPMENT WAS SUBSTANDARD, ITS PILOTS WERE NOT TRAINED FOR THE MISSIONS THEY WOULD EXECUTE, AND, MOST IMPORTANTLY, PURSUIT AVIATION LACKED A COHERENT THEORY FOR GAINING AIR SUPERIORITY. AIRMEN EVEN THEORIZED THAT THE ACHIEVEMENT OF AIR SUPERIORITY MIGHT NOT EVEN BE POSSIBLE. PURSUIT'S SHORTCOMINGS WERE DIRECTLY ATTRIBUTABLE TO ITS EVOLUTION IN THE INTERWAR YEARS. IN MOVING FROM THE CENTER OF THE AIR SERVICE IN THE 1920S TO A PURELY SECONDARY FORCE IN THE 1930S, PURSUIT SUFFERED AS ITS DOCTRINE SHIFTED TO THE PURELY DEFENSIVE AND AIRMEN FORGOT THE LESSONS OF WORLD WAR I.

Pursuit Interwar Development

US PURSUIT AVIATION IN THE INTERWAR YEARS RODE A VERITABLE ROLLER COASTER. EMERGING AS THE FUNDAMENTAL ARM OF AVIATION AFTER WORLD WAR I, PURSUIT SUFFERED A DRASTIC DECLINE AS THE AIR CORPS SHIFTED ITS FOCUS TO STRATEGIC BOMBARDMENT. PURSUIT, HOWEVER, DID NOT DISAPPEAR, BUT ROSE ONCE AGAIN AS A CRITICAL COMPONENT OF AIRPOWER ONCE OVERSEAS WARS PROVED PURSUIT COULD EFFECTIVELY INTERCEPT AND DESTROY BOMBARDMENT AIRCRAFT. UNFORTUNATELY, DURING PURSUIT'S WILD RIDE LEADING UP TO WORLD WAR II, PURSUIT AVIATORS FORGOT MANY OF THE VALUABLE LESSONS LEARNED IN WORLD WAR I. THUS, PURSUIT AVIATION WAS NOT AS READY AS IT SHOULD HAVE BEEN ENTERING THE SECOND WORLD WAR.

PURSUIT'S INITIAL STATURE EMERGING FROM WORLD WAR I REVOLVED AROUND A REALIZATION GAINED DURING THE GREAT WAR THAT WITHOUT AIR SUPERIORITY PROVIDED BY PURSUIT, EFFECTIVE AIR OPERATIONS WERE IMPOSSIBLE. AFTER THE WAR, AIRMEN EXPANDED THAT CONCEPT, ARGUING THAT BOTH LAND AND SEA OPERATIONS WOULD ALSO BE SUBJECT TO AIRPOWER FROM WHICHEVER SIDE CONTROLLED THE AIR. HENCE, PURSUIT WAS VITAL FOR THE SUCCESS OF AIR, LAND, AND MARITIME OPERATIONS. THIS ARGUMENT CAST PURSUIT AS THE FUNDAMENTAL AIR ARM.

PURSUIT, HOWEVER, DID NOT REMAIN THE FUNDAMENTAL AIR ARM FOR LONG. BY 1926, BOMBARDMENT PROponents ARGUED THAT PURSUIT WAS MERELY A FORCE ENABLER, NOT A DECISIVE FORCE IN AND OF ITSELF. WHILE IT ENABLED BOMBERS AND ATTACK AIRCRAFT TO ACCOMPLISH THEIR MISSIONS, PURSUIT HAD NO INTRINSIC VALUE IN AND OF ITSELF. IN OTHER WORDS, PURSUIT COULD SHOOT DOWN EVERY ENEMY PLANE, YET THE WAR WOULD CONTINUE AND PURSUIT AIRCRAFT WOULD BE SUPERFLUOUS FROM THAT POINT ON. ON THE OTHER HAND, STRATEGIC BOMBARDMENT OFFERED A MEANS TO END THE WAR. THUS, THE AIR CORPS, AFTER 1926, ACKNOWLEDGED THAT PURSUIT WAS A SUPPORTING FORCE AND BOMBARDMENT THE FUNDAMENTAL AIR-FIGHTING ARM. THIS SHIFTED THE AIR CORPS PRIORITY FROM PURSUIT TO BOMBARDMENT.

A FURTHER SHIFT IN RESOURCES TOWARDS BOMBARDMENT FOLLOWED IN THE EARLY 1930S. AIDED BY CIVILIAN ADVANCES IN LARGE AIRPLANE DESIGN, BOMBARDMENT AIRCRAFT FOR A BRIEF PERIOD ENJOYED A TECHNOLOGICAL EDGE OVER THEIR PURSUIT COUNTERPART. THAT EDGE GAVE BOMBERS A SIGNIFICANT ADVANTAGE IN SPEED, RANGE, ARMAMENT, AND ALTITUDE CAPABILITY WHEN COMPARED TO THE CONCURRENT PURSUIT DURING A CRITICAL TIME IN THE DEBATE BETWEEN BOMBER AND FIGHTER ADVOCATES. THE BOMBARDMENT PROponents ARGUED THAT BOMBARDMENT COULD SUCCEED UNESCORTED IN THE FACE OF ENEMY OF PURSUIT AND THAT HOSTILE PURSUIT WOULD BE HAPLESS TO DEFEND AGAINST THE MODERN BOMBER. THEIR CONCLUSION, QUESTIONED THE VERY VIABILITY AND PRACTICALITY OF PURSUIT. THIS CONCLUSION LED AIR CORPS LEADERS TO DOUBT THE NEED FOR

PURSUIT AVIATION. ON THE OTHER HAND, THE PURSUIT ADVOCATES, ESPECIALLY CAPT CLAIRE CHENNAULT, ARGUED THAT PURSUIT, AS DEMONSTRATED BY WORLD WAR I, WOULD CAUSE UNACCEPTABLE LOSSES TO ANY BOMBARDMENT ATTACK.

THE AIR CORPS NEVER SATISFACTORILY SETTLED THE DEBATE ON THE MERITS OF THE DIFFERENT POSITIONS. BOMBARDMENT ADVOCATES INSTEAD SILENCED THE CALLS FOR PURSUIT DEVELOPMENT BY CONVINCING A VAST MAJORITY OF THE INSTRUCTORS AT THE AIR CORPS TACTICAL SCHOOL THAT BOMBARDMENT WAS PRIMARY.¹ AS A RESULT, A SCHISM DEVELOPED WITHIN THE AIR CORPS BETWEEN BOMBARDMENT AND PURSUIT. AIRMEN GRAVITATED TO ONE SIDE OF THE DEBATE OR THE OTHER, CONSIDERING THEMSELVES EITHER PURSUITERS OR BOMBARDIERS.² BOMBARDMENT, AS THE APPARENT VICTOR FROM THE DEBATE, RECEIVED THE MAJORITY OF APPROPRIATIONS AND ATTENTION FOR PERSONNEL ASSIGNMENT. THE AIR CORPS FAVORED BOMBARDMENT BECAUSE IT PROVIDED AN OFFENSIVE ARM FOR THE AIR CORPS, CAPABLE OF ACHIEVING STRATEGIC EFFECTS AS OPPOSED TO PURSUIT WHOSE MISSION THE AIR CORPS VIEWED AS PURELY DEFENSIVE. ADDITIONALLY, STRATEGIC BOMBARDMENT REINFORCED THE AIR CORPS' CALL FOR INDEPENDENCE, AND THEREBY GAINED EVEN MORE FAVOR AMONG AVIATORS.³ AFTER SILENCING THE CLAIMS OF PURSUIT, BOMBARDMENT ADVOCATES ENTRENCHED UNESCORTED BOMBING AS THE AIR CORPS CONCEPT OF OPERATIONS, A CONCEPT THAT WOULD PROVE FAULTY IN WORLD WAR II.

FOR THE PURSUIT AVIATOR, THE DEFENSIVE MISSION BECAME A MEANS OF SURVIVAL. FOR PURSUIT TO SURVIVE AS A NECESSARY FORM OF AVIATION, IT HAD TO PROVE IT COULD EFFECTIVELY FIND AND THEN DESTROY BOMBARDMENT AIRCRAFT. THEREFORE, PURSUIT EXERCISES AND EMPLOYMENT IN THE SECOND HALF OF THE 1930S FOCUSED ON EXERCISING AIR WARNING NETWORKS TO INTERCEPT BOMBERS AND TESTS TO PROVE THAT PURSUIT COULD DESTROY BOMBARDMENT ONCE IT INTERCEPTED THE BOMBERS. UNFORTUNATELY, BOMBERS AND FIGHTERS DID LITTLE WORK TOGETHER TO VALIDATE THE EFFECT OF PURSUIT ON BOMBARDMENT AIRCRAFT. HENCE, ALTHOUGH FIGHTERS PROVED THE ABILITY TO INTERCEPT BOMBERS AS EARLY AS 1933 WITH EXERCISES AT FORT KNOX, THE ABILITY OF PURSUIT TO DEFEAT AIRBORNE BOMBERS REMAINED IN QUESTION UNTIL THE WAR IN EUROPE.⁴

THE WAR IN EUROPE DEMONSTRATED WHAT US PURSUIT PILOTS HAD FAILED TO SHOW, THAT ONCE PURSUIT INTERCEPTED BOMBARDMENT AIRCRAFT, THE PURSUIT PLANES HAD A DECIDED ADVANTAGE. THIS REALIZATION TOOK HOLD IN 1939 AND BEGAN PURSUIT'S RESURGENCE WITHIN THE AIR CORPS. LEADING UP TO WORLD WAR II, PURSUIT'S MISSION EXPANDED OUT OF THE DEFENSIVE INTO A BROADER, MORE OFFENSIVE MISSION, AND PURSUIT GAINED IN IMPORTANCE BECOMING SECOND ONLY TO STRATEGIC BOMBARDMENT.

UNFORTUNATELY, FOR THE AIR CORPS AND THE NATION, THE RESURGENCE BEGAN TOO LATE TO ALLOW PURSUIT TO FULLY RECOVER FOR WORLD WAR II. AMERICAN PURSUIT FIGHTERS LAGGED BEHIND OTHER MAJOR POWER'S FIGHTERS IN 1939 AND CONTINUED TO LAG THEM UPON ENTERING THE WAR IN 1941. ENEMY AND OTHER ALLIED FIGHTERS SIMPLY OUTMATCHED THE P-40. NOT UNTIL THE ARMY AIR FORCES (AAF) INTRODUCED THE P-47 IN THE FALL OF 1942, DID THE UNITED STATES FIELD A COMPARABLE FIGHTER.⁵ ADDITIONALLY, US PURSUIT PILOTS HAD TRAINED ONLY TO EXECUTE DEFENSIVE MISSIONS AGAINST ENEMY BOMBARDMENT, BECAUSE PRIOR TO 1939, PURSUIT'S SOLE MISSION WAS DEFENSE OF THE UNITED STATES AND ITS POSSESSIONS. THUS, AS LATE AS THE FALL OF 1942, THE AAF NEEDED TO RETRAIN ITS PURSUIT PILOTS IN AFRICA AND EUROPE BECAUSE THEY ONLY HAD RECEIVED DEFENSIVE TRAINING IN THE UNITED STATES.

¹ David E. Johnson, *Fast Tanks and Heavy Bombers (FT&HB)* (Ithaca, N.Y.: Cornell University Press, 1998), 156.

² Martha Byrd, *Kenneth N. Walker: Airpower's Untempered Crusader* (Maxwell AFB, Ala.: Air University Press, 1997), 37.

³ Johnson, *FT&HB*, 166.

⁴ Claire Lee Chennault, *Way of a Fighter* (1949, reprint Tucson, Ariz.: James Thorvardson & Sons, 1991), 23.

⁵ The P-47 prototype, the AP-10 flew in 1939. Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York, N.Y.: Random House, 1993), 116-117. Arguably, the P-38 introduced in November 1941 could at least hold its own against enemy fighters. At altitude, however, it was inferior to both the German FW-190 and Me-109. W. A. Jacobs, "Operation Overlord," in *Case Studies in the Achievement of Air Superiority*, ed. Benjamin Franklin Cooling (Washington, D.C.: Government Printing Office, 1994), 277.

THE MOST CRIPPLING EFFECT, HOWEVER, OF PURSUIT'S DECLINE IN THE INTERWAR YEARS WAS ITS LOSS OF THE CONCEPT OF AIR SUPERIORITY. BY FOCUSING ITS MISSION SOLELY ON HEMISPHERIC DEFENSE, PURSUIT CEDED ITS ROLE IN ATTAINING THEATER-WIDE AIR SUPERIORITY. INSTEAD, PURSUIT FOCUSED ON MAKING ENEMY ATTACKS TOO COSTLY TO CONTINUE BY CAUSING UNACCEPTABLE LOSSES, BUT TOOK NO ACTION TO GAIN AIR SUPERIORITY OFFENSIVELY. THUS, IN BOTH AFRICA AND EUROPE AIRMEN HAD TO RELEARN PAINFULLY THE FORGOTTEN WORLD WAR I LESSONS OF THE REQUIREMENT FOR AIR SUPERIORITY AND THE METHODS TO GAIN IT THROUGH OFFENSIVE PURSUIT ACTION.

Why was Pursuit Aviation Unprepared?

THAT PURSUIT AVIATION WAS UNPREPARED FOR WORLD WAR II IS APPARENT, WHAT IS LESS APPARENT IS THE REASON WHY. ULTIMATELY, THE MAIN REASON PURSUIT AVIATION SURVIVED BETWEEN THE WARS IS THE SAME REASON IT WAS NOT READY FOR WORLD WAR II. SPECIFICALLY, ONCE THE AIR CORPS RESOLVED THE BOMBER-FIGHTER DEBATE IN FAVOR OF THE BOMBER, PURSUIT GRAVITATED TO THE ONLY MISSION LEFT TO IT – DEFENSE. ENSCONCED IN THE DEFENSIVE ROLE, PURSUIT PILOTS TRAINED FOR HEMISPHERIC DEFENSE AND THE AIR CORPS PRODUCED AIRCRAFT SPECIFICALLY DESIGNED FOR THAT MISSION. THE FIGHTERS THE UNITED STATES USED ON ITS ENTRY INTO WORLD WAR II WERE TAILORED TO THE DEFENSIVE MISSION. THE P-40 WAS A SHORT-RANGE POINT DEFENSE FIGHTER, WHILE THE P-39 AND P-38 WERE LONGER-RANGE INTERCEPTORS MEANT TO DESTROY HOSTILE BOMBERS. THE UNITED STATES DID NOT HAVE AN ESCORT FIGHTER, BECAUSE THE DEFENSIVE MISSION OF PURSUIT DID NOT NEED A LONG-RANGE ESCORT FIGHTER.

IN PART, PURSUIT'S DEFENSIVE MINDSET WAS DUE TO THE UNITED STATES' INTERNATIONAL POLICY. AMERICA'S ISOLATIONIST ATTITUDE AND THE CONCOMITANT DEFENSIVE ROLE FOR THE AIR ARM ARE APPARENT FROM THE MORROW BOARD IN 1925 THROUGH ROOSEVELT'S AIR ARM EXPANSION IN 1939. HOWEVER, WHILE PURSUIT FIT NEATLY INTO THE DEFENSE OF THE UNITED STATES, THE DEFENSIVE POLICY ALONE DID NOT INHIBIT PURSUIT'S GROWTH. BOMBARDMENT AVIATION IN THE SAME PERIOD DEVELOPED INTO A HIGHLY OFFENSIVE FORCE. THE AIR CORPS JUSTIFIED THE DEVELOPMENT OF HEAVY BOMBERS BY EMPHASIZING THEIR IMPORTANCE TO HOMELAND DEFENSE. LIKewise, IF THE AIR CORPS FORESAW THE NEED FOR ESCORT, PURSUIT COULD HAVE DEVELOPED INTO THE FORCE NEEDED FOR WORLD WAR II. INSTEAD, PURSUIT REMAINED IN A DEFENSIVE MINDSET, A MINDSET RESULTING IN PART FROM THE BOMBER-FIGHTER DEBATE.

THAT DEFENSIVE MINDSET RESTRAINED PURSUIT DEVELOPMENT AS EVIDENCED BY THE AIR CORPS TREATMENT OF PURSUIT ESCORT. THE 1ST PURSUIT GROUP HAD DEMONSTRATED THE POTENTIAL FOR PURSUIT AIRCRAFT TO INCREASE THEIR RANGE WITH EXTERNAL TANKS IN THE EARLY 1920S. FURTHER, INITIAL OBSERVATIONS IN BOTH ASIA AND EUROPE BEFORE THE UNITED STATES ENTERED THE WAR HIGHLIGHTED THE EFFICACY OF EXTERNAL TANKS. YET, THE US ARMY AIR FORCES FAILED TO PUSH FOR THEM IN THEIR STRATEGIC CAMPAIGN AGAINST GERMANY. INSTEAD, AS THE AIR CORPS HAD DONE IN THE MID-1930S, IT PUSHED FOR A LARGE CONVOY ESCORT. BOTH THE XFM-1 AND THE YB-40 ARE INDICATORS OF THE DEFENSIVE MINDSET PERVAING THE AIR CORPS' TREATMENT OF PURSUIT. WHEN ASKED TO DEVELOP AN ESCORT FOR BOMBERS, AIRMEN ENVISIONED AN ESCORT THAT WOULD *DEFEND THE BOMBERS*, NOT *GAIN AIR SUPERIORITY* IN THE AIRSPACE WHERE THE BOMBERS WERE OPERATING. THIS CONCEPT OF DEFENSE VICE AIR SUPERIORITY PERVADED ALL ASPECTS PURSUIT AVIATION AND WAS THE LARGEST FACTOR THAT CONFINED PURSUIT AIRMEN TO A DEFENSIVE MINDSET.

THE CONCEPT OF PURSUIT OPERATIONS THAT LACKED ANY MEASURE OF AIR SUPERIORITY IS ITSELF PARTLY AN OUTCOME OF THE DEVELOPMENT OF STRATEGIC BOMBING. AFTER 1926, THE AIR CORPS DEFINED ITSELF BY ITS FUNDAMENTAL AIR ARM, BOMBARDMENT. AIRMEN IDENTIFIED BOMBARDMENT, AND SPECIFICALLY STRATEGIC BOMBARDMENT, AS THE UNIQUE AND DECISIVE ROLE OF THE AIR CORPS. FOR STRATEGIC BOMBARDMENT TO BE A VIABLE CONCEPT, THE BOMBERS HAD TO BE ABLE TO GET TO THEIR TARGETS. DURING THE EARLY 1930S AS THE AIR CORPS SOLIDIFIED ITS STRATEGIC BOMBARDMENT THEORY, BOMBERS OUTRANGED THEIR COMPARABLE PURSUIT PLANES. HENCE, FOR BOMBERS TO SUCCEED AND HIT THEIR TARGETS, THEY HAD TO BE ABLE DO SO WITHOUT AN ESCORT FIGHTER. THEREFORE, BOMBERS HAD TO BE ABLE TO ACCOMPLISH THEIR MISSION WITHOUT FRIENDLY PURSUIT GAINING AIR SUPERIORITY. MORE IMPORTANTLY, HOSTILE PURSUIT ALSO COULD NOT LIKEWISE GAIN AIR SUPERIORITY. SINCE BOMBARDMENT THEORY DEMANDED HOSTILE PURSUIT COULD NEVER GAIN AIR SUPERIORITY, THEN BY DEFAULT, NEITHER COULD FRIENDLY PURSUIT AVIATION. FROM THIS LOGIC, IT WAS A SHORT LEAP TO THE NOTION THAT NEITHER FRIENDLY NOR HOSTILE PURSUIT COULD

GAIN AIR SUPERIORITY.⁶ IN OTHER WORDS, PURSUIT ACTED ONLY AS A DETRACTOR TO THE PRIMARY MISSION OF BOMBARDMENT; ALONE IT COULD NEITHER GAIN AIR SUPERIORITY NOR DENY IT TO THE ENEMY.

BY 1939, EXAMINATIONS OF THE WAR IN EUROPE, AND TO SOME EXTENT THE FIGHTING IN ASIA, REVEALED THAT AT LEAST IN A DEFENSIVE ROLE, PURSUIT COULD GAIN AIR SUPERIORITY BY INFLICTING SUCH CASUALTIES ON BOMBARDMENT AS TO CAUSE THE ATTACKER TO CEASE OPERATIONS. THIS REALIZATION LED TO THE RESURGENCE OF PURSUIT, YET TWO YEARS LATER IN AFRICA AND EUROPE, THE AAF STILL DID NOT RECOGNIZE THE NECESSITY OF PURSUIT TO HELP GAIN AIR SUPERIORITY THROUGH OFFENSIVE OPERATIONS.

IN RETROSPECT, IT IS APPARENT THAT THE RISE OF BOMBARDMENT NOT ONLY RELEGATED PURSUIT TO A DEFENSIVE MISSION, BUT THAT IT ALSO DESTROYED THE NOTION OF PURSUIT AS AN IMPORTANT FACTOR IN GAINING AIR SUPERIORITY. ONCE AIRMEN ACCEPTED THE IDEA THAT AIR SUPERIORITY WAS NOT FEASIBLE THROUGH PURSUIT ACTION, THEY FURTHER EMBRACED THE DEFENSIVE MISSION, LEADING THEM FURTHER AWAY FROM AIR SUPERIORITY IN A SELF-FEEDING CYCLE. ONLY THE REALITIES AND HARD LESSONS OF WAR ENABLED PURSUIT TO BREAK FROM ITS DEFENSIVE MINDSET AND FIGHT TO ACHIEVE AIR SUPERIORITY.

Lessons for Today

AIRMEN BETWEEN WORLD WAR I AND WORLD WAR II HAD ONLY THEIR EXPERIENCES FROM A SINGLE WAR TO BASE THEIR AIRPOWER THEORY UPON, WHEREAS THE AIR FORCE TODAY HAS OVER 90 YEARS OF EXPERIENCE AND MULTIPLE WARS TO DRAW ON. DESPITE THE CHANGES IN TECHNOLOGY OVER THE YEARS, THERE ARE SOME SIMILARITIES BETWEEN THE PROBLEMS FACED THEN AND TODAY AND VALUABLE LESSONS ONE CAN DRAW FROM PURSUIT'S INTERWAR EXPERIENCE.

THE ENDURING LESSON IS THE IMPORTANCE OF AIR SUPERIORITY FOR AIR, GROUND, OR MARITIME OPERATIONS. AIR SUPERIORITY IS NOT THE AIR FORCE'S ULTIMATE OBJECTIVE, BUT IT IS AS CRITICAL AN ENABLER TODAY AS IT WAS IN WORLD WAR II. AIR SUPERIORITY CONFERS NOT JUST PROTECTION, BUT FREEDOM FOR FRIENDLY USE OF THE AIR WHILE DENYING HOSTILE AIR FORCES THE SAME FREEDOM OF ACTION. TODAY, GAINING AIR SUPERIORITY GOES FAR BEYOND FIGHTER AIRCRAFT. AS IN WORLD WAR II, ALL ASPECTS OF AVIATION MUST CONTRIBUTE TO GAINING AIR SUPERIORITY. ADDITIONALLY, THE THREAT HAS CHANGED. WHEREAS THE GREATEST THREAT TO AIRCRAFT IN WORLD WAR II WAS HOSTILE PURSUIT, TODAY THE GREATEST THREAT MAY WELL LIE IN HOSTILE SURFACE-TO-AIR CAPABILITIES. REGARDLESS, THE AIR FORCE MUST BE ABLE TO SECURE FREEDOM OF ACTION.

IN THE EARLY 1930S, US BOMBERS TECHNICALLY OUTSTRIPPED THE CURRENT FIGHTERS GIVING THEM FREEDOM OF ACTION TO CONDUCT UNESCORTED DEEP STRIKES. TODAY, STEALTH GIVES THE UNITED STATES A SIMILAR ADVANTAGE. MUCH LIKE THE 1930S, HOWEVER, STEALTH IS ONLY AS EFFECTIVE AS THE TECHNICAL ADVANTAGE IT PROVIDES. ONCE HOSTILE COUNTRIES COUNTER STEALTH, THE AIR FORCE WILL AGAIN HAVE TO SEEK THE MEANS TO ENSURE FREEDOM OF ACTION FOR ITS STRIKE AIRCRAFT BEYOND RELYING ON STEALTH. NOR IS COUNTER-STEALTH THE ONLY ENEMY CAPABILITY TO WORRY ABOUT. FIFTH-GENERATION FIGHTERS, GUIDED AND BALLISTIC MISSILES, AND INFORMATION ATTACKS WILL ALL CHALLENGE THE UNITED STATES' ABILITY TO SECURE AIR SUPERIORITY. WHILE THE FUTURE IS UNCERTAIN, AIRMEN CERTAINLY WILL BE CALLED UPON TO PROVIDE AIR SUPERIORITY IN FUTURE CONFLICTS. THIS DEMANDS THAT AIRMEN BE EQUIPPED AND TRAINED TO ACHIEVE AIR SUPERIORITY IN ANY FORESEEABLE CONFLICT. AS SUCH, AIRMEN MUST BE ABLE TO COHERENTLY ARGUE AND DEFEND AIRPOWER'S ROLE IN GAINING AIR SUPERIORITY.

IN THE INTERWAR YEARS, PURSUIT AVIATORS FAILED IN EXACTLY THIS TASK. THE DEBATE BETWEEN BOMBERS AND FIGHTERS WAS LESS OF A DEBATE AND MORE OF A FIGHT. CHENNAULT'S UNWILLINGNESS TO GIVE GROUND OR OFFER A SOLUTION, OTHER THAN TO SAY UNESCORTED BOMBING WOULD NOT WORK, NOT ONLY FUELED THE CONFLICT BUT INDICATED A DISCONNECT BETWEEN PURSUIT AND BOMBARDMENT PROPONENTS.⁷ THAT DISCONNECT DEVELOPED INTO A PERSONAL BATTLE PITTING

⁶ Instead, the Air Corps accepted the notion that the bomber would gain air superiority by hitting enemy airfields and through attrition of enemy pursuit in the air. AWPD/I highlighted this fact, but recognized Germany had over 500 well-dispersed and hardened airfields; hence, it targeted aircraft production rather than the aircraft or airfields themselves in its plan to gain air superiority.

⁷ Johnson, *FT&HB*, 157.

THE BOMBER ADVOCATES AGAINST CHENNAULT. HIS BIOGRAPHER, MARTHA BYRD, SPECIFICALLY NOTES THE RELATIONSHIP BETWEEN CHENNAULT AND BOMBARDMENT ADVOCATE 1LT KENNETH N. WALKER, AN ACTS INSTRUCTOR FROM 1929 TO 1933. SHE WRITES, "OBSERVERS USED THE WORD 'RABID' TO DESCRIBE BOTH, EVEN SUGGESTING, 'IF THEY HAD HAD TOMAHAWKS, THEY WOULD HAVE SCALPED ONE ANOTHER.'"⁸ THE POST-WAR RECOLLECTIONS OF GENERAL LAURENCE KUTER, AN ACTS BOMBARDMENT INSTRUCTOR FROM 1935 TO 1937, SUPPORT BYRD'S CONTENTION THAT THE BOMBER-FIGHTER DEBATE WAS NOT AN OPEN DISCUSSION BUT RATHER AN INTERPERSONAL BATTLE. KUTER NOTED, "WE JUST OVERPOWERED CLAIRE [CHENNAULT], WE JUST WHIPPED HIM."⁹ BECAUSE THE BOMBER-FIGHTER DEBATE TOOK ON SUCH A PERSONAL CRUSADE, IT HURT US AVIATION BY DRIVING A STAKE BETWEEN BOMBER AND FIGHTER EMPLOYMENT. IT SPLIT THE TWO FORMS OF AIRPOWER APART; PREVENTING EITHER FROM OPERATING EFFECTIVELY TOGETHER.

MUCH LIKE THE PURSUIT DEBATE IN THE EARLY 1930S, THE AIR FORCE TODAY MUST BE ABLE TO ADDRESS THE NEED FOR AIR SUPERIORITY IN A RATIONAL, OPEN-MINDED DISCUSSION WITHOUT DRIVING A STAKE BETWEEN IT AND THE OTHER SERVICES. THE F/A-22 MAY BE THE RIGHT ANSWER, BUT THE AIR FORCE MUST BE ABLE ARGUE THE NEED FOR THE F/A-22 WITH AN OPEN MIND AND WITH NO HIDDEN AGENDAS. LIKewise, THE OTHER SERVICES MUST ALSO ENGAGE IN THE DISCUSSION AND UNDERSTAND THAT THE AIR FORCE'S FIRST PRIORITY WILL ALWAYS BE ENSURING AIR, AND NOW SPACE, SUPERIORITY. WITHOUT IT, ALL OTHER ACTIONS; AIR, LAND, SEA, OR SPACE ARE PRONE TO FAILURE.

AN ADDITIONAL LESSON DRAWN FROM PURSUIT'S INTERWAR DEVELOPMENT IS THE USEFULNESS OF A MULTI-ROLE PLATFORM. IN WORLD WAR II, THE AMERICAN PURSUIT AIRCRAFT AND PILOTS PERFORMED EXCEPTIONALLY WELL IN THE AIR-TO-GROUND ROLE PROVIDING ATTACK AVIATION. AS THE 1933 ACTS *PURSUIT AVIATION* TEXT CITED AT THE BEGINNING OF THE CHAPTER NOTES, PURSUIT SPECIFIC AIRCRAFT, SUCH AS THE AIR-TO-AIR DEDICATED F-15C, ARE ONLY REQUIRED WHEN MULTI-ROLE AIRCRAFT CANNOT ADEQUATELY PERFORM AIR-TO-AIR FUNCTIONS. THE FORESEEN THREAT DICTATES THE LEVEL OF AIR-TO-AIR PERFORMANCE REQUIRED. WHEN A MULTI-ROLE AIRFRAME CAN FIT THE BILL AGAINST ANY FORESEEN THREAT, THEN THE AIR FORCE SHOULD PARCEL OUT AIR-TO-AIR CAPABILITIES TO MULTI-ROLE AIRCRAFT. THIS IS IN PART, BECAUSE AIR SUPERIORITY PLATFORMS, IF SUCCESSFUL, PUT THEMSELVES OUT OF BUSINESS BY DESTROYING THE ENEMY, OR AS SEEN RECENTLY IN IRAQ, BY CONVINCING THEM NOT TO FLY. THE 1933 ACTS TEXT ALSO, HOWEVER, HAS AN IMPLIED CAUTION THAT THE PURSUIT FUNCTION MUST BE SATISFIED FIRST. IT SPECIFICALLY NOTES, "WHEN THE PURSUIT TYPE PLANE... BECOMES SUITABLE FOR USE BY OTHER BRANCHES... PURSUIT AVIATION WILL HAVE LOST ITS FUNCTIONAL REASONS FOR EXISTENCE." THE AUTHOR OF THE 1933 TEXT, MOST LIKELY CHENNAULT, CHIEF OF THE ACTS PURSUIT SECTION, NOTES IT IS THE PURSUIT PLANE THAT OTHER BRANCHES EMPLOY, RECOGNIZING IMPLICITLY THAT PURSUIT, AND HENCE AIR SUPERIORITY MUST BE THE FIRST PRIORITY. THIS PRIMARY TEXT, ALMOST 75 YEARS OLD, PROVIDES AN ENDURING LESSON THAT MUST NOT BE FORGOTTEN WHEN PURCHASING EQUIPMENT, TRAINING AIRMEN, OR PLANNING FUTURE OPERATIONS.

FINALLY, THIS THESIS SERVES AS A CAUTIONARY TALE. AIRMEN IN THE INTERWAR YEARS LET TECHNOLOGY AND THEORY OVERCOME THE LESSONS OF WORLD WAR I. WITHOUT SATISFACTORY PROOF OF CONCEPT, AIRMEN RELEGATED PURSUIT UNJUSTLY TO A DEFENSIVE ROLE AND IGNORED ITS CONTRIBUTION TO AIR SUPERIORITY. AS THE AIR FORCE TRANSFORMS ITSELF TO FIGHT ON THE 21ST CENTURY BATTLEFIELD, IT MUST REMEMBER ITS HISTORY AND NOT LOSE SIGHT OF THE CORE COMPETENCIES THAT HAVE MADE IT SUCCESSFUL IN THE PAST.

⁸ Byrd, *Walker*, 36.

⁹ General Laurence Kuter, quoted in Johnson, *FT&HB*, 166 and Robert T. Finney, *History of the Air Corps Tactical School 1920-1940* (1955, reprint Maxwell AFB, Ala.: Air Force History and Museums Program, 1998), 106-107.

BIBLIOGRAPHY

Primary Sources

GOVERNMENT DOCUMENTS

AIR CORPS TACTICAL SCHOOL. *THE AIR FORCE*. MAXWELL FIELD, ALA.: AIR CORPS TACTICAL SCHOOL, APRIL 1930, AFHRA 248.101-1

AIR CORPS TACTICAL SCHOOL. "PURSUIT AVIATION: A BRIEF STUDY." MAXWELL FIELD, ALA.: THESIS, AIR CORPS TACTICAL SCHOOL, 1931-1932, AIR FORCE HISTORICAL RESEARCH AGENCY (AFHRA) 248-282-8.

AIR CORPS TACTICAL SCHOOL. *PURSUIT AVIATION*. MAXWELL FIELD, ALA.: AIR CORPS TACTICAL SCHOOL, FEBRUARY 1933, AFHRA 248.101-8.

AIR CORPS TACTICAL SCHOOL. *PURSUIT AVIATION*. MAXWELL FIELD, ALA.: AIR CORPS TACTICAL SCHOOL, SEPTEMBER 1933, AFHRA 248.101-8.

AIR CORPS TACTICAL SCHOOL. *PURSUIT AVIATION*. MAXWELL FIELD, ALA.: AIR CORPS TACTICAL SCHOOL, OCTOBER 1937, AFHRA 248.101-8.

AIR CORPS TACTICAL SCHOOL. *PURSUIT AVIATION*. MAXWELL FIELD, ALA.: AIR CORPS TACTICAL SCHOOL, SEPTEMBER 1939, AFHRA 248.101-8.

AIR CORPS TACTICAL SCHOOL. "PURSUIT AVIATION – SHORT COURSE (4) 1940." MAXWELL FIELD, ALA, 5 APRIL 1940, AFHRA 248.2809D.

AIR SERVICE. *FUNDAMENTAL CONCEPTIONS OF THE AIR SERVICE*. 1923, AFHRA 248.211-65S.

AIR SERVICE TACTICAL SCHOOL (ASTS). *EMPLOYMENT OF COMBINED AIR FORCE*. LANGLEY FIELD, VA.: AIR SERVICE TACTICAL SCHOOL, 1925-1926, AFHRA 248.101-7A.

ANDREWS, MAJ GEN FRANK M., CHIEF OF THE GHQ AIR FORCE. "AIR DEFENSE." ADDRESS TO CLEVELAND WOMEN'S CHAPTER OF THE NATIONAL AERONAUTICAL ASSOCIATION, 2 SEPTEMBER 1937. IN *ARMY AND NAVY JOURNAL* LXXV, NO. 2 (11 SEPTEMBER 1937): 4.

ARMY WAR COLLEGE. *FUNDAMENTAL PRINCIPLES FOR THE EMPLOYMENT OF THE AIR SERVICE 1925-1926*. CARLISLE BARRACKS, PA., 1925-1926, AFHRA 248.211-65F.

ARNOLD, LT COL H. H. TO THE CHIEF OF THE AIR CORPS. LETTER. SUBJECT: EMPLOYMENT OF TACTICAL UNITS EQUIPPED WITH MODERN PURSUIT AND BOMBARDMENT AIRPLANES, 26 NOVEMBER 1934, AFHRA 248.282-27

Arnold, Maj Gen H. H. Memorandum to Commanding General, GHQ Air Force. Subject: Pursuit Training and Pursuit Plane and Tactical Development, 14 November 1939. In Report of the Air Corps Board. "Study No. 54: Pursuit Training and Pursuit Plane and Tactical Development." Maxwell Field, Ala.: 27 August 1940, AFHRA 167.5-54.

Air War Plans Division/1. "Munitions Requirements of the AAF." 12 August 1941, AFHRA 145.82-1 pt. 2. Document is now declassified.

Brett, Maj George H. Memorandum. To Commanding General, 5th Corps Area. Subject: Final Report of Defense Commander (Air Corps): Joint Antiaircraft – Air Corps Exercise, 29 June 1933, 14, AFHRA 248.2124-13.

BRIGGS, 1LT JAMES E. MEMORANDUM TO COMMANDING OFFICER 18TH PURSUIT GROUP. SUBJECT: COOPERATIVE GUNNERY PROBLEM WITH THE 50TH OBSERVATION SQUADRON, 1 MARCH 1937, AFHRA 242.282.

CHENNAULT, CAPT CLAIRE L. MEMORANDUM. SUBJECT: COMMENTS ON 'A SUGGESTION FOR STUDY AND DEVELOPMENT,' 4 DECEMBER 1934, AFHRA 248.282-11.

CHENNAULT, CAPT CLAIRE. MEMORANDUM. TO THE COMMANDANT, THE AIR CORPS TACTICAL SCHOOL. SUBJECT: COMMENTS ON LETTER TO CHIEF OF THE AIR CORPS, 7 MARCH 1935, AFHRA 248.282-27.

CHENNAULT, CAPT C. L. *THE ROLE OF DEFENSIVE PURSUIT*. 1933, AFHRA 248.282-4.

FECHET, BRIG GEN JAMES E. COMMANDER ARMY AIR CORPS. "AIR-GROUND MANEUVERS SAN ANTONIO, TEXAS MAY 15 – MAY 21, 1927." AFHRA 248.2122.

FIELD SERVICE REGULATION, FM 100-20. *COMMAND AND EMPLOYMENT OF AIR POWER*. 21 JULY 1943, AFHRA K170.121020-100.

FINAL REPORT OF WAR DEPARTMENT SPECIAL COMMITTEE ON ARMY AIR CORPS. WASHINGTON, D.C.: GOVERNMENT PRINTING OFFICE, 1934.

FRANK, MAJ W. H. "CRITIQUE AIR-GROUND MANEUVERS FIFTH CORPS AREA, MAY 1929." ADDRESS. WRIGHT FIELD, OHIO, 26 MAY 1929, AFHRA 248.2122.

GEORGE, MAJ H. H. "PURSUIT AVIATION: EMPLOYMENT OF TYPE A AND TYPE B PURSUIT AIRPLANES." MAXWELL FIELD, ALA.: THESIS, AIR CORPS TACTICAL SCHOOL, 1936-1937, AFHRA 248.282-30.

GHQ AIR FORCE (PROVISIONAL). *G-4 REPORT OF THE GHQ. AIR FORCE (PROVISIONAL)*. 1933, AFHRA 248.2122-3.

GHQ AIR FORCE (PROVISIONAL). *GHQ AIR FORCE (PROVISIONAL) COMMAND AND STAFF EXERCISES 354.1 CRITIQUE*. 15 MAY 1933, AFHRA 248.2122-3.

GRIFFISS, CAPT TOWNSEND. AIR CORPS OBSERVER. MEMORANDUM. SUBJECT: SPAIN (AVIATION): ORGANIZATIONAL TRAINING, TACTICS EMPLOYED, 25 APRIL 1937, AFHRA 248.282-23.

HALE, MAJ WILLIS H. "S-3 REPORT OF AIR CORPS FIELD EXERCISES AND DEMONSTRATIONS 1930." 22 JULY 1930, 15-16, AFHRA 248.2122-1

KENNEY, GEN GEORGE C. TRANSCRIPT OF ORAL HISTORY INTERVIEW BY COL MARVIN STANLEY, N.D., AFHRA K239.0512-747.

Kilbourne, Brig Gen C. E. Memorandum. Subject: Doctrines of the Army Air Corps, 21 December 1934, V-1, AFHRA 248.211-15.

LASSITER, MAJ GEN WILLIAM, ET AL. *REPORT OF A COMMITTEE OF OFFICERS APPOINTED BY THE SECRETARY OF WAR*. WASHINGTON, D.C.: WAR DEPARTMENT, 22 MARCH 1923, AFHRA 145.93-102A.

LONGANECKER, LT COL IRA, TRANS., "THE AIR-GROUND MANEUVERS OF THE AIR CORPS OF THE US ARMY, FIFTH CORPS AREA, COLUMBUS, O., MAY 21-26, 1929." 5 MAY 1931, AFHRA 248.2122.

MALONE, CAPT A. J. KERWIN. "PURSUIT AVIATION IN THE SINO-JAPANESE WAR." MAXWELL FIELD, ALA.: THESIS, AIR CORPS TACTICAL SCHOOL, 1939, AFHRA 248.282-28.

MAULCAHY, CAPT MICHAEL. "TWO SEATER PURSUIT." MAXWELL FIELD, ALA.: THESIS, AIR CORPS TACTICAL SCHOOL, 1928, N.P., AFHRA 248.282-11.

MCCORMICK, HARLAN T. "HISTORY AND DEVELOPMENT OF PURSUIT AVIATION." MAXWELL FIELD, ALA.: THESIS, AIR CORPS TACTICAL SCHOOL, 1937-1938, AFHRA 248.282-36.

MEMORANDUM. SUBJECT: REBUTTAL TO LT COL WILSON'S MEMORANDUM FOR COLONEL HARMON, 1 MAY 1939, AFHRA 248.282-36.

MILLING, MAJ THOMAS DEW. AIR SERVICE FIELD OFFICERS' SCHOOL TRAINING REGULATION No. 440-15, *AIR TACTICS*, 1922, AFHRA 248.101-4A.

MILLING, MAJ THOMAS DEW. "TACTICS OF THE AIR FORCES IN WAR." LECTURE. ARMY WAR COLLEGE, WASHINGTON BARRACKS, D.C., 27 NOVEMBER 1923, AFHRA 248.211-65N.

Mosley, Maj Gen George Van Horn. Memorandum. To Commanding General, 5th Corps Area. Subject: Report by the Director of Joint Antiaircraft – Air Corps Exercise, 29 June 1933, AFHRA 248.2124-13.

PARKER, MAJ JAMES E. CHIEF OF PURSUIT SECTION, ACTS. MEMORANDUM. SUBJECT: PURSUIT QUESTIONNAIRE, 1939, AFHRA 248.282.

PARTRIDGE, CAPT E. E. "PURSUIT IN SUPPORT OF THE AIR FORCE." LECTURE. ACTS, MAXWELL FIELD, ALA., 13 DECEMBER 1938, AFHRA 248.2808-17.

PARTRIDGE, GEN EARLE E. TRANSCRIPT OF ORAL HISTORY INTERVIEW BY TOM STURM AND HUGH N. AHMANN, 23-25 APRIL 1974, AFHRA K239.0512-729.

PATRICK, MAJ GEN MASON M. LETTER. 7 FEBRUARY 1923, 3D IND. TO *REPORT OF A COMMITTEE OF OFFICERS APPOINTED BY THE SECRETARY OF WAR*. WASHINGTON, D.C.: WAR DEPARTMENT, 22 MARCH 1923, AFHRA 145.93-102A.

REPORT OF THE AIR CORPS BOARD. "STUDY No. 2: MULTI-ENGINE FIGHTER AIRCRAFT." MAXWELL FIELD, ALA.: 15 JULY 1935, AFHRA 167.5-2.

REPORT OF THE AIR CORPS BOARD. "STUDY No. 35: EMPLOYMENT OF AIRCRAFT IN DEFENSE OF THE CONTINENTAL UNITED STATES." MAXWELL FIELD, ALA.: 7 MAY 1939, AFHRA 167.5-35.

REPORT OF THE AIR CORPS BOARD. "STUDY No. 49: BOMB CARRYING REQUIREMENTS FOR PURSUIT AVIATION." MAXWELL FIELD, ALA.: 5 DECEMBER 1939, AFHRA 167.5-49.

REPORT OF THE AIR CORPS BOARD. "STUDY No. 54: PURSUIT TRAINING AND PURSUIT PLANE AND TACTICAL DEVELOPMENT." MAXWELL FIELD, ALA.: 27 AUGUST 1940, AFHRA 167.5-54.

SPAATZ, GEN CARL A. TRANSCRIPT OF ORAL HISTORY INTERVIEW BY AUTHOR GOLDBERG, 19 MAY 1965, AFHRA K239.0512-755.

STERLING, 1LT J. M., MEMORANDUM. TO CHIEF, PURSUIT SECTION ACTS. SUBJECT: OPERATING DATA – PURSUIT PROBLEM, 29 APRIL 1937, AFHRA 248.282.

TAYLOR, CAPT Y. H. "PURSUIT AVIATION." MAXWELL FIELD, ALA.: THESIS, AIR CORPS TACTICAL SCHOOL, 1937, AFHRA 248.282-11.

WARBURTON, CAPT E. K. "PURSUIT TACTICS AND TECHNIQUE." MAXWELL FIELD, ALA.: THESIS, AIR CORPS TACTICAL SCHOOL, 1938, AFHRA 248.282-37.

WAR DEPARTMENT, AIR CORPS FIELD MANUAL 1-5. *EMPLOYMENT OF AVIATION IN THE ARMY*. 15 APRIL 1940, AFHRA 170.121001-5.

War Department Training Regulation No. 440-15. *Air Service: Fundamental Principles for the Employment of the Air Service*. 26 January 1926, AFHRA 170.108.

War Department Training Regulation No. 440-15. *Air Corps: Employment of the Air Forces of the Army*. 15 October 1935, AFHRA 170.108.

WESTOVER, MAJ GEN OSCAR, CHIEF OF AIR CORPS. ADDRESS. NATIONAL AERONAUTIC ASSOCIATION MEETING, CHICAGO, IL., 30 NOVEMBER 1936, AFHRA 248.211-71.

WESTOVER, BRIG GEN O. *REPORT OF THE COMMANDING GENERAL OF THE GHQ. AIR FORCE (PROVISIONAL)*. 1933, AFHRA 248.2122-3.

WILSON, LT COL DONALD. MEMORANDUM TO COLONEL HARMON. SUBJECT: SCHOOL POLICY WITH RESPECT TO THE EMPLOYMENT OF PURSUIT AVIATION, 1 MAY 1939, AFHRA 248.282-36.

Books

ARNOLD, H. H. *GLOBAL MISSION*. 1949. REPRINT, BLUE RIDGE SUMMIT, PA.: TAB BOOKS INC., 1989.

BRERETON, LT GEN LEWIS H. *THE BRERETON DIARIES: THE WAR IN THE PACIFIC, MIDDLE EAST AND EUROPE, 3 OCTOBER 1941 – 8 MAY 1945*. NEW YORK, N.Y.: WILLIAM MORROW AND COMPANY, 1946.

CHENNAULT, CLAIRE LEE. *WAY OF A FIGHTER*. 1949. REPRINT, TUCSON, ARIZ.: JAMES THORVARDSON & SONS, 1991.

DYESS, LT COL WM. E. *THE DYESS STORY: THE EYE-WITNESS ACCOUNT OF THE DEATH MARCH FROM BATAAN AND THE NARRATIVE OF EXPERIENCES IN JAPANESE PRISON CAMPS AND OF EVENTUAL ESCAPE*. NEW YORK, N.Y.: G. P. PUTNAM'S SONS, 1944.

MACCLOSKEY, BRIG GEN MONRO. *TORCH AND THE TWELFTH AIR FORCE*. NEW YORK, N.Y.: RICHARDS ROSEN PRESS, 1971.

MOMYER, GENERAL WILLIAM W. *AIR POWER IN THREE WARS (WWII, KOREA, VIETNAM)*. MAXWELL AFB, ALA.: AIR UNIVERSITY PRESS, 2003.

REPORT OF THE PRESIDENT'S AIRCRAFT BOARD. WASHINGTON, D.C.: GOVERNMENT PRINTING OFFICE, 1925.

SHERMAN, WILLIAM C. *AIR WARFARE*. 1926. REPRINT, MAXWELL AFB, ALA.: AIR UNIVERSITY PRESS, 2002.

ARTICLES AND PERIODICALS

"BARKSDALE FIELD PERSONNEL IN FLORIDA MANEUVERS." *AIR CORPS NEWS LETTER* XIX, NO. 2 (15 JANUARY 1936): 22.

CHANEY, BRIG GEN JAMES E. "YESTERDAY AND TODAY." *AIR CORPS NEWS LETTER* XIX, NO. 7 (1 APRIL 1936): 1-2.

"FIRST PURSUIT GROUP." *AIR SERVICE NEWS LETTER* X, NO. 6 (16 APRIL 1926): 19-20.

"GUN CAMERA FOR PURSUITERS." *AIR CORPS NEWS LETTER* XV, NO. 15 (28 DECEMBER 1931): 468.

"MIMIC WARFARE AT LOS ANGELES." *AIR CORPS NEWS LETTER* XIV, NO. 7 (9 JUNE 1930): 153.

"SELFRIDGE FIELD, MT. CLEMENS, MICH., MARCH 16." *AIR SERVICE NEWS LETTER* X NO. 5 (5 APRIL 1926): 24-25.

"THE BOMBING COMPETITION AT LANGLEY FIELD." *AIR SERVICE NEWS LETTER* X, NO. 8 (24 MAY 1926): 5.

"TRAINING OF THE FIRST PURSUIT GROUP." *AIR CORPS NEWS LETTER* XVI, NO. 5, (3 MAY 1932): 158.

Secondary Sources

GOVERNMENT DOCUMENTS

"THE FUTURE DEVELOPMENT IN FIGHTER AIRCRAFT." LECTURE, 1947, AHRA 248.281-19.

AIR FORCE DOCTRINE DOCUMENT (AFDD) 2-8. *COMMAND AND CONTROL*, 16 FEBRUARY 2001.

BOOKS

BAKER, LEONARD AND B. F. COOLING. "DEVELOPMENTS AND LESSONS BEFORE WORLD WAR II." IN *CASE STUDIES IN THE ACHIEVEMENT OF AIR SUPERIORITY*. EDITED BY BENJAMIN FRANKLIN COOLING. WASHINGTON, D.C.: GOVERNMENT PRINTING OFFICE, 1994.

Bartsch, William H. *Doomed at the Start: American Pursuit Pilots in the Philippines, 1941-1942*. College Station, Tex.: Texas A&M University Press, 1992.

BYRD, MARTHA. *CHENNAULT: GIVING WINGS TO THE TIGER*. TUSCALOOSA, ALA.: UNIVERSITY OF ALABAMA PRESS, 1987.

BYRD, MARTHA. *KENNETH N. WALKER: AIRPOWER'S UNTEMPERED CRUSADER*. MAXWELL AFB, ALA.: AIR UNIVERSITY PRESS, 1997.

Budiansky, Stephen. *Air Power*. New York, N.Y.: Viking, 2004.

CAMERON, REBECCA HANCOCK. *TRAINING TO FLY: MILITARY FLIGHT TRAINING 1907-1945*. WASHINGTON, D.C.: AIR FORCE HISTORY AND MUSEUMS PROGRAM, 1999.

- CRAVEN, WESLEY FRANK AND JAMES LEA CATE, EDS. *THE ARMY AIR FORCE IN WORLD WAR II. VOL. 1, PLANS AND EARLY OPERATIONS: JANUARY 1939 TO AUGUST 1942*. CHICAGO, ILL.: THE UNIVERSITY OF CHICAGO PRESS, 1948.
- CRAVEN, WESLEY FRANK AND JAMES LEA CATE, EDS. *THE ARMY AIR FORCE IN WORLD WAR II. VOL. 2, EUROPE: TORCH TO POINTBLANK, AUGUST 1942 TO DECEMBER 1943*. CHICAGO, ILL.: THE UNIVERSITY OF CHICAGO PRESS, 1949.
- EDMONDS, WALTER D. *THE FOUGHT WITH WHAT THEY HAD*. 1951. REPRINT, WASHINGTON, D.C.: CENTER FOR AIR FORCE HISTORY, 1992.
- FABER, LT COL PETER R. "INTERWAR US ARMY AVIATION AND THE AIR CORPS TACTICAL SCHOOL: INCUBATORS OF AMERICAN AIRPOWER." IN *THE PATHS OF HEAVEN: THE EVOLUTION OF AIR POWER THEORY*. EDITED BY COL PHILLIP S. MEILINGER. MAXWELL AFB, ALA.: AIR UNIVERSITY PRESS, 1997.
- FINNEY, ROBERT T. *HISTORY OF THE AIR CORPS TACTICAL SCHOOL 1920-1940*. 1955. REPRINT MAXWELL AFB, ALA.: AIR FORCE HISTORY AND MUSEUMS PROGRAM, 1998.
- GILMORE, BRIG GEN W. E. "REPORT OF AIR CORPS FIELD EXERCISES AND DEMONSTRATIONS 1930." 22 JULY 1930, AFHRA 248.2122-1.
- GREER, THOMAS H. *THE DEVELOPMENT OF AIR DOCTRINE IN THE ARMY AIR ARM 1917-1941*. 1955. REPRINT, WASHINGTON, D.C.: OFFICE OF AIR FORCE HISTORY, 1985.
- GOLDBERG, ALFRED, ED., *A HISTORY OF THE UNITED STATES AIR FORCE, 1907-1957*. PRINCETON, N.J.: D. VAN NOSTRAND, 1957.
- HOLLEY, IRVING BRINTON, JR. *BUYING AIRCRAFT: MATERIAL PROCUREMENT FOR THE ARMY AIR FORCES*. WASHINGTON, D.C.: CENTER OF MILITARY HISTORY, 1989.
- Hough, Richard and Denis Richards. *Battle of Britain*. New York, N.Y.: W. W. Norton & Company, 1989.
- JACOBS, W. A. "OPERATION OVERLORD." IN *CASE STUDIES IN THE ACHIEVEMENT OF AIR SUPERIORITY*. EDITED BY BENJAMIN FRANKLIN COOLING. WASHINGTON, D.C.: GOVERNMENT PRINTING OFFICE, 1994.
- Johnson, David E. *Fast Tanks and Heavy Bombers*. Ithaca, N.Y.: Cornell University Press, 1998.
- JOHNSON, COL WRAY R. INTRODUCTION TO WILLIAM C. SHERMAN, *AIR WARFARE*. 1926. REPRINT, MAXWELL AFB, ALA.: AIR UNIVERSITY PRESS, 2002.
- Kennett Lee. *The First Air War 1914-1918*. New York, N.Y.: The Free Press, 1991.
- MAURER, MAURER. *AVIATION IN THE U.S. ARMY, 1919-1939*. WASHINGTON, D.C.: OFFICE OF AIR FORCE HISTORY, 1987.
- McFARLAND, STEPHEN L. AND WESLEY PHILLIPS NEWTON. *TO COMMAND THE SKY: THE BATTLE FOR AIR SUPERIORITY OVER GERMANY, 1942-1944*. WASHINGTON, D.C.: SMITHSONIAN INSTITUTION PRESS, 1991.

Mets, David R. *Master of Airpower: General Carl A. Spaatz*. Novato, Calif.: Presidio, 1988.

Mets, David R. "A Glider in the Propwash of the Royal Air Force? Gen Carl A. Spaatz, the RAF, and the Foundations of American Tactical Air Doctrine." In *Airpower and Ground Armies: Essays on the Evolution of Anglo-American Air Doctrine 1940-1943*. Edited by Daniel R. Mortensen. Maxwell AFB, Ala.: Air University Press, 1998.

Miller, Edward S. *War Plan Orange*. Annapolis, Md.: Naval Institute Press, 1991.

Perret, Geoffrey. *Winged Victory: The Army Air Forces in World War II*. New York, N.Y.: Random House, 1993.

HISTORICAL STUDIES

DOYLAN, BERNARD. *DEVELOPMENT OF THE LONG-RANGE ESCORT FIGHTER*. USAF HISTORICAL STUDY 136. MAXWELL AFB, ALA.: USAF HISTORICAL DIVISION, AIR UNIVERSITY, 1955.

MORTENSEN, DANIEL R. *A PATTERN FOR JOINT OPERATIONS: WORLD WAR II CLOSE AIR SUPPORT, NORTH AFRICA*. WASHINGTON, D.C.: OFFICE OF AIR FORCE HISTORY AND U.S. ARMY CENTER OF MILITARY HISTORY, 1987.

ARTICLES AND PERIODICALS

CATE, LT COL DEVIN L. "THE AIR SUPERIORITY FIGHTER AND DEFENSE TRANSFORMATION." MAXWELL AFB, ALA.: AIR UNIVERSITY PRESS, 2003. AVAILABLE FROM [HTTP://WWW.AU.AF.MIL/AU/AWC/AWCGATE/MAXWELL/MP30.PDF](http://www.au.af.mil/au/awc/awcgate/maxwell/mp30.pdf).

FABER, LT COL PETER R. "THE DEVELOPMENT OF US STRATEGIC BOMBING DOCTRINE IN THE INTERWAR YEARS: MORAL AND LEGAL?" *JOURNAL OF LEGAL STUDIES*, 7, (1996/1997), N.P. ON-LINE. INTERNET, 24 APRIL 2005. AVAILABLE FROM [HTTP://ATLAS.USAFA.AF.MIL/DFL/DOCUMENTS/MORLEG.DOC](http://atlas.usafa.af.mil/DFL/DOCUMENTS/MORLEG.DOC).

EMERSON, WILLIAM R. "OPERATION POINTBLANK: A TALE OF BOMBERS AND FIGHTERS." HARMON MEMORIAL LECTURE. UNITED STATES AIR FORCE ACADEMY, COLO., 27 MARCH 1962.

"MAJOR GENERAL JAMES E. CHANEY." *AIR FORCE LINK*. ON-LINE. INTERNET, 8 MAY 2005. AVAILABLE FROM [HTTP://WWW.AF.MIL/BIOS/BIO.ASP?BIOID=4973](http://www.af.mil/bios/bio.asp?bioID=4973).

MEILINGER, LT COL PHILLIP S. "THE IMPACT OF TECHNOLOGY AND DESIGN CHOICE ON THE DEVELOPMENT OF US FIGHTER AIRCRAFT." *JOURNAL OF AMERICAN AVIATION HISTORICAL SOCIETY*, SPRING 1991, 60-69.

MILLER, ROGER G. "A 'PRETTY DAMN ABLE COMMANDER' – LEWIS HYDE BRERETON: PART II." *AIR POWER HISTORY* 48, NO. 1 (SPRING 2001): 22-45.

NATIONAL MUSEUM OF THE USAF. "VIRTUAL AIRCRAFT GALLERY." ON-LINE. INTERNET, 7 MAY 2005. AVAILABLE FROM [HTTP://WWW.WPAFB.AF.MIL/MUSEUM/IND/IND.HTM](http://www.wpafb.af.mil/museum/ind/ind.htm).

NATIONAL MUSEUM OF THE USAF. "CONSOLIDATED P-30." ONLINE. INTERNET, 7 MAY 2005. AVAILABLE FROM [HTTP://WWW.WPAFB.AF.MIL/MUSEUM/RESEARCH/P30.HTM](http://www.wpafb.af.mil/museum/research/p30.htm).

"THE MUNICH PACT SEPTEMBER 29, 1938." YALE UNIVERSITY. ON-LINE. INTERNET, 9 MAY 2005.
AVAILABLE FROM [HTTP://WWW.YALE.EDU/LAWWEB/AVALON/IMT/MUNICH1.HTM](http://www.yale.edu/lawweb/avalon/imt/munich1.htm).