

12 February 1979

Dr. Kenneth Werrell
Radford College
Radford, VA

Dear Dr. Werrell:

It was good to talk with you this evening, and when I visit Maxwell next week I will be sure to take your message to Jerry Hasselwander.

I am enclosing a copy of the form letter, and some other forms, I have been using to try to elicit information from former members of the 306th. I would say that up to now I have met with fair success in this venture. Just today I received copies of four orders from a banker in Phoenix.

Much of it, I find, is just plugging at it, and eventually a lot of material turns up. A Laurinburg businessman lets me use his Eastern U. S. WATS line, which has been most helpful in reaching a number of men. I have interviewed in person several dozen men, plus many more by telephone, and have received written material from more than 300.

As I mentioned, I've talked with Eaker and Hansell, corresponded with Gen. Robert Williams, several members of the 306th who later became generals, and thus far one of the former group commanders. I hope next summer to see the other two surviving ones, as well as quite a number of squadron commanders.

Much to my wife's delight, I have finally begun to write, after three years of research. I began when I lived in Dayton, OH, about three miles from the Air Museum, and have spent considerable time at Archives in Washington, as well as the Library of Congress.

One of the things I didn't mention on the phone, is that I got into files in Archives of the First Air Division, in which I was led to stenographic minutes of the commanders' meetings following missions. At first these came after each mission, but later on were held each

week or two. These are most interesting, but I find that the 306th colonels were not especially talkative. LeMay tended to dominate much of it, along with Fred Anderson. But it is interesting to relate what they are saying and planning to the actual mission strategy for the future.

I am also now working in some of the Oral History materials at Maxwell, hoping to flesh out some things from that.

Luckily, most of the men I am dealing with seem willing to answer direct questions, and I have been able to clear up a lot of things. Also, several contacts in England are proving useful in pinning down things.

I hope that you find the enclosed bibliography and the Echoes of interest. If you would like, I'll be happy to add your name to the regular mailing list for Echoes.

If you have occasion to travel close to Laurinburg, let me know. I would welcome an opportunity to spend more time talking with you.

One other thing that might interest you is that last year I gave several talks on a bombing mission. I chose the 12 Sep 44 raid to Ruhland, as it was one I flew and one in which we had a lot of trouble. I have also been able to document most of it. I spent four days in a class at St. Andrews running through it in great detail, and then made 45 minute presentations for history classes in Charlotte taught by my two oldest sons. We are going to do it again this spring, and expect to produce a decent video tape out of it.

Sincerely yours,

COMMONWEALTH OF VIRGINIA



RADFORD COLLEGE

RADFORD

20 February 1979

Dear Russ;

It was a pleasure to talk with you on the phone the other evening. I hope that your trip to Maxwell went well, and that you found what you were looking for. Thanks for the materials that you sent.

I just checked through my draft and found a number of mentions of the 306th. I'll list them and ask that if you have information to confirm or modify my account that you *WILL* please let me know. I'm trying to write a book on the Eighth that will not only relate its story, but tell of the tactical and strategic decisions that were made. Thus, I picked out the missions that were significant in bombing results or losses.

As to the casualty figures in 306th Echoes, I, no. 3. The only "similar" figures I've seen deals with casualties by position, but for aircraft that made it back. For 110 men killed and 1007 wounded the percentages by crew position were: P 7.4%w, 7.3%k; CP 6.8%w, 5.5%w; N 12.2%w, 11.8%k; B 17.7%w, 16.3%k; RO 8.6% w, 7.3%k; Waist 21.1%w, 19%k, Ball 5.9%w, 6.4%k; TT 8.3%w, 9.1%k and Tail 12%w, 17.3%k. You will note that this comes out somewhat different than your list.

I ran across a quote from Armstrong shortly after he took over the 306th. He didn't want the job as he thought the unit was ruined. ^{LATER} He noted the increase in both morale and efficiency and believed it to be almost as good a unit as the 97th.

Eaker in a letter to Arnold dated 20 July 1943 said that Armstrong is the "best man we have here, the fellow who most nearly fits the picture . . . Armstrong. He is the fightingest fellow in the top ranks we have produced in this theater."

2LT James M. Steward ditched in the channel and was rescued 9 Oct. 1942. My version is that Snuffy Smith was a "difficult" character and was grounded. Is it true that he was in the guardhouse when Stimson came to give him the MH? On 17 April 1943 (Bremen) the 367BS lost 4/5 and 368BS lost 5/6. By January 1944 the 367BS had suffered 40% of the group's losses while the 368BS had gone 42 consecutive missions without a loss. On 21 May 1943 Le Mersa Lass claimed 11 GAF aircraft before ditching. A mascot of the 306th, a dog named "Mister" flew 8 missions. On the 14 October 1943 Schweinfurt mission the 306th was one of four BGs to get over 50% of its bombs within 1,000 feet of the aiming point. On 11 Dec. 1943 the 306th did the best of 21 BGs getting 23% of its bombs within 1,000 feet of the aiming point. I have also mentioned Arizona Harris and Lt Judas getting Judy home on the Bremen mission.

According to a Swedish mag the following 306th bombers were interned: ^{THEAG} 42-40006 on 6 March 1944; 42-31737 on 18 July 1944; and 42-97658 on 3 Feb. 1945. The first was sold for parts, and other two were flown out.

In addition to information on the status of those shot down (killed, died in prison, and returned) I wonder if you have any information on the reason for the delay on 17 August 1943 and anything on the Dresden raid?

Do you have any information on crewmembers refusing to fly? Do you have the information on the 12 Sept. 1944 mission written up? Also, what missions did the 306th suffer its greatest losses?

Thanks for the bibliography. I wish I had had it before I tried to put the enclosed bibliographic article together. My only question is listing Bert Stiles' Serenade to the Big Bird under fiction. I have always been under the impression it was a memoir. Do you know something that I should know?

I would like to get down to visit with you. I fear that you can help me more than I can help you, but in any case, I'd like to compare notes with you. Maybe we can work something out.

Yes, I'd like to get on the mailing list for the 306th Echoes. You're doing a fine job so I expect your manuscript to be one of the better group histories.

Well, best regards from a rather cold and snowy Virginia.

Yours truly,

Ken

I am looking for any good war stories especially if they haven't appeared in print. As I'm about up to June 1944, I'd like to get some more stories on the last year of the war.

I have some tidbits I've come across that you'd might like for the book or 306th Echoes. Let me know if you're interested.

22 February 1979

Dear Ken,

I spent a pleasant two hours Monday with Jerry Hasselwander in the Maxwell Historical Research Center. Found some interesting things, and sampled a few items, but had to leave at 10:15. I hope to get back for a week of intensive reading later this year.

I did see there Gen. Longfellow's office diary, which is terrific as to what was happening in his office as CG of VIII BC from Dec 42 to Jun 43. Hope to be able to read through it all some day.

I do not find any quote from Armstrong on taking the 306th in my materials, but most of what I have is pretty laudatory. I've always been amused, though, about his being asked about his relationship to "12 O'Clock High". When asked about the woman (and that part of the book was very true, friends who were there tell me), Armstrong said "my wife knows there not a damn bit of truth in it".

Now, as to some other items:

Lt. James M. Stewart, flying in 24486 did not ditch on 9 Oct 42. Quoting from the official intelligence report "No. 2 engine was out of gas on return trip and soon both outboard engines wrecked their bearings trying to keep up with the formation. Began to lose altitude. When down to 1500 feet over channel, Lt. Stewart was about to put the plane down in the water as the radio was out. Just then, at 1020 a spitfire came up and led the plane from midchannel toward land. Coming to hills, the Spitfire wagged wings and let down wheels to indicate a landing. Coming over hill, Lt. Strwart saw aerodrome and was able to land safely. Entire crew feel that they owe lives to Flight Lieutenant A. J. Andrews, RAF, 91st squadron at Hawkinge, as one of the life rafts was gone and plane had no radio working." This was signed by Watts S. Humphrey, Major AC, S-2, 306th Bomb Group.

Snuffy was not in the guardhouse, but peeling potatoes on KP, when it was time for Stimson to do his thing. I've not seen any evidence of Smith ever being in the guardhouse. He was a pain in the neck

(still is), and worked at odd jobs around the base, until Col. Sutton and Maj. Duy conspired at end of 1944 to ship him home. They got him back to the states before anyone knew what had happened, and thus got rid of him. When I was there Snuffy worked nights in group operations.

I

I think it was the 369th that had the long string without losses, and this occurred in 1943.

The 11 planes shot down on the Bremen raid is OK. I question the name of the plane. I'm not sure it had one. I'll be able to check this more thoroughly in a week or two. Checked my Smith file, and the plane was "Dearly Beloved." Pilot was R. H. Smith, who was killed in the Gulf after returning to U. S.

The dog story I think is O.K. I think the owner was Harold Rogers, a onetime Hollywood stuntman, no deceased.

Lt. Maxwell Judas on the Bremen raid, 17 Apr 43, got hit hard over the target. #3 engine was feathered there, and a 20mm shell blew off the top of the upper turret. Judas put the plane into a dive to avoid fighters. On the way back, the #2 propellor fell off, the bombbay doors could not be closed, and they came back at 150 feet much of the way.

If you want to know more, I'll be happy to call Judas. He lives in Tennessee, and we've become quite friendly over the phone. He was shot down 21 May 43 over Wilhelmshaven.

As to Sweden, 42-40006 burned on landing, taking off most of the nose and cockpit. Have a picture of it on the ground.

The 17 August 43 raid was delayed because of fog in the Midlands. The 3rd division, on the coast in East Anglia, could get up, but the 1st division couldn't see well enough to take off.

Nothing much on the Dresden raid. Group history on 17 Apr 45 says "306th flew 39 a/c including 4PFF and 40 "C" Wing led by Capt. Hasse. The large marshalling yard in southern Dresden was the target for the day. Dense persistent contrails and haze in the target area caused the lead bombardier, 1st Lt. (Leo A. G.) Oldenburg, much difficulty; however, he managed a visual sighting and pictures show lead bombs on the briefed aiming point. High bombed largely by PFF, and pattern fell to the north. Because of poor visibility over Dresden, 5 a/c of the low squadron, unable to see the lead drop, brought bombs back."

We had a ball turret gunner quit. He had flown a tour with the 19th in the Pacific, and found Europe too rough. He quit after 4th mission to Berlin 21 Jun 44 when we had external wing fires and staggered home. I knew a bombardier who refused to fly, a Jewish kid, whom they tried then to humiliate into flying again. Don't think he ever did. There were others who quit too.

The 306th suffered its worst losses, 10 planes each, on 17 Apr 43, 14 Oct 43, 24 Apr 44. Lost 3 planes in a midair collision near

Werrell - 3

in May 44. Surprisingly, there were three survivors. Planes just disappeared in bad weather. 22 Feb 44, Bernberg was also a big day for losses and 12 Sep 44.

I have not written much on the 12 Sep 44.

When I went back to college after the war I wrote my experiences during a semester when I had an individualized writing course. This is proving to be a valuable document.

The absolutely very best thing I have, a treasure which I won't show until after my book is done, is a diary kept by the original group surgeon during the first year in combat. It is fantastic, the best thing I've ever seen on the 8th--libelous as hell, but accurate, and usually written on a daily basis. I have a copy in my file, and also, several other diaries which are generally incomplete and not nearly as well done.

I'd be interested in any tidbits on the 306th you have.

I have questionnaires back from over 200 men in the 306th, and am still collecting them.

Would love to have you come down some time. Have accommodations, etc., for you and wife, and I think it might be quite profitable for both of us.

We have a historian at St. Andrews who is a WWII man, George Melton, who is currently working on a book on Darlan.

Hope some of these answers will be of help to you.

Sincerely yours,

Dear June & Russ -

Spring is fast approaching and with it are many new opportunities for achieving new goals and accomplishments in life.

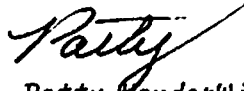
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Sincerely,



Patty VanderWier
Realtor Associate

PV:csp

MARCH 1979

Just A Note...



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27 February 1979

Dear Ken:

You asked earlier on the takeoff delay for 1st Schweinfurt, and I gave you an answer on that.

I came across the Second Schweinfurt weather at Maxwell, which you might find of interest. At 1000 hours at Thurleigh it was 200 feet visibility, 10/10 clouds at 100 feet, wind north at 6. Other stations were reporting fog, drizzle, rain, although there was none of this at Thurleigh.

Thought you might find that of interest.

Sincerely yours,

C
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P
Y

27 March 1979

Dr. Kenneth Werrell
Radford College
Radford, VA 24142

Dear Ken:

You asked about the 306th plane ditching on 9 Oct 42, raid to Lille; attached is the teletype message concerning this plane, which may give a little more detail than I did in my letter to you.

Also, I am attaching duplicate copies I have of two group commanders' meetings. These are interesting to follow through, as they usually get into a discussion of tactics, and one can see some of the development in them.

I have a fair set of them, although I am not sure that I have them all. They began to have them fairly frequently, but later began to spread them out.

I talked with Col. George L. Robinson (306th CO 6-43 to 9-44) about them last Friday. He said that usually they involved only the wing or division staff in discussion, and that group commanders only spoke when spoken to.

Hope these will be interesting. When you get some free time, I hope you might drop down to Laurinburg, and I am sure that I can provide considerable material of interest to you.

Sincerely yours,

May 2, 1979

Mr. Russell A. Strong
Rt. 1, Turnpike Road
Laurinburg, NC 28352

Dear Russ:

Thank you for your letter and the materials. They were very helpful.

Sorry I haven't written earlier, but things are quite busy here as we wind down the regular school year.

I am planning to depart for Montgomery soon after graduation on May 25, 1979. I would very much like to spend some time with you, perhaps an afternoon or evening. Do you have any plans to be out of Laurinburg on May 26, June 2, or June 9? I have some concern about getting gas, but I guess I'll face that as it comes.

I don't know how much I can help you with your project, but you surely can help me with mine. I am especially interested in the MIA statistics you have compiled, war stories (particularly for the last year of the war), and leads on any materials I haven't seen at the Air Force Archives.

Sincerely,


Kenneth P. Werrell
Associate Professor of History

KPW:pr

7 May 1979

Dear Ken:

Look forward to your coming.

May 26 is commencement here, a morning event, so I'll be free in the afternoon. I suspect now that I'll be here June 2 and 9.

I am planning both a trip to Maxwell and a trip to California this summer on my research, but won't know until about May 21 what I may be doing when. I may take off for somewhere in June.

If you should come on one of those dates, I hope you'll plan to stay overnight with us, unless you are bringing a crowd along. Our guest room will accommodate two very nicely, and is unoccupied most of the time, so we'll just reserve it for you. I figure that way we can get more talking in too.

I keep getting questionnaires back, and sending out more, as I get track of people. I'm still trying to find at least one person from every crew shot down where there were survivors. Turned up an only survivor the other day who says he will respond. Each one adds a few more bits of information. Its also interesting how much garbled stuff one picks up.

Just to take care of the housekeeping details, let me give you some directions to my home. I don't know how you might come, but I imagine you will get on US-220 at some point. If you do, come to Rockingham and turn east on US-74. Just west of Laurinburg you will see overhead signs. Stay left on the business route a mile or so. Just after passing City limits sign, turn right on Turnpike Road. We are about 1½ miles south of this turn. Keep straight on to stop sign. Keep straight on here and we are the second house on the right, an old white farmhouse with 13 pillars across the front and down one side. Telephone 919/276-9392.

Give us a few days notice and we'll be ready for you.

14 May 1979

1112 Grove Avenue

Radford, Va. 24141

Dear Russ,

Thank you for your kind invitation. Right now, I'm planning to leave Radford Saturday morning (^{2 JUNE}~~26 May~~) and start toward Laurinburg. I am writing one of my old profs at Duke to see if he'll be in Durham that day. If so, I'll stop by and see him for a few hours and then continue south, arriving late that afternoon or early evening. I'd like then to leave Sunday morning so I can be in Montgomery when they open Monday morning. I'm ~~am~~ some what concerned about the gas situation, but I guess I'll just have to play that one by ear. I'll call you Friday night to confirm my plans. (That is, Friday, ^{1 JUNE}~~25 May~~.)

I'll be coming alone, and I do look forward to talking with you. I've just about finished my manuscript, so the visit with you and to Montgomery will, I trust, put on the icing.

If the ^{2nd}~~26th~~ is bad for you, please let me know. I could certainly come your way on my return from Montgomery.

Yours truly,

Ken
I just realize that Monday, 28 May is Memorial Day.

17 May 1979

Dear Ken:

June 2 looks fine. I am sure we will have a fine discussion, and I have invited one or two of my sons who are most interested in the 8th to sit in. I'll just tell them to be quiet.

Glad you noted that Memorial Day. I almost got trapped going down there for a couple of hours by a holiday. The Feds have a lot of such.

Now, if you are coming from Durham, I have slightly different directions. Take 15-501 south, use the bypass around Southern Pines. At Laurinburg take the 401 bypass, and at the blinker light (only one in town) turn right. You will hit an overpass and about a quarter mile on a fourway intersection. Turn left. My house will be the second on the right.

Here's a picture, so you can't miss it.

Anytime you want to arrive is o.k., the earlier the better.

Sincerely yours,

Y
d
O
C

10 June 1979

1112 Grove Ave.

Radford, Va. 24141

Dear Russ,

I want to thank you and your wife again for the wonderful hospitality. I enjoyed the "pig-picking" and of course visiting with you both. You played a major part in making my trip successful.

The research at Montgomery went well. I think I've gotten about all that I need to finish up the manuscript in short order.

I asked Jerry Hasselwander to check how ^{much} material there was on the 306th and its squadrons, which is on the enclosed yellow sheet. I did not see the material, but he tells me that it is a little over one file drawer. Now there may be more 306th stuff under other headings, such as Longfellow's office diary, the group commander meetings, etc. I'd be interested to learn how much you are able to find.

I wish you well on both the Montgomery trip and on your jaunt to California. Those two expeditions should give you enough data to finish most of the research phase.

I checked the item on the aircraft names. It is in the Library of Congress, Eaker Collection, Box 17. The names I copied under the 306th (I didn't copy them all, only the ones I thought were interesting at the time): Lone ~~Raider~~, Terry the Pirate, Eight Ball, Sons of Fury, Old Faithful, Eager Beaver, The Exterminators, The Galloping Ghost, The Devil's Word Shop, Snuffy Smith, Yankee Raider, The Wahoo, Texas Hun Hunter. The citation for the Le Mersa Lass is from Freeman, page 48. Is he in error?

I read in the last edition of 306th Echoes that Antonelli got four credits in one day. What day was that? Who was the top scoring gunner in the 306th and how many credits did he have?

Finally, I'm interested in the breakdown of what happened to the men missing on the bombers downed: that is the number killed, E&E, and captured. Maxwell has no idea of the numbers in these categories.

Well best regards to the family. I hope that your project is going well and that you'll get a lot done this summer. Best of luck.

Ken

29 June 1979

Dear Russ,

Greetings from Virginia. I hope your trip to California went well & that you have enough data (+ the right data) to continue writing.

I've just about finished the draft. Enclosed is the "color" chapter we talked about. I'd appreciate any comments you (but especially) can.

Later this summer I'll send you a copy of the conclusion. It might be of interest to you & Gary.

Best regards
Ken

6 July 1979

Dear Ken:

Your chapter came in yesterday's mail, and of course I dropped everything to read it through.

Particularly in the mission part I have a number of comments to make. I hope you can make all of them out. Perhaps some evening next week I'll give you a ring and we can talk about anything then.

As to Freeman's plane reference La Mersa Lass, I am sure that should have been Lamesa Lass, as one of the attached itmes will tell you. Not knowing his Texas geography, Freeman had never flown over Lamesa, TX, like we used to do in navigation training.

One of the best air sea rescue stories I know of came out of the 306th, with Robert H. Smith's crew downing 11 e/a, all credited, and then spending 30 hours in the North Sea on 17-18 May 43. The entire crew survived, which has to be something of a miracle. Hence, I'm sending along some material on it. They got a full two pages in Look magazine.

Smith was later killed in a training accident in the states. McCallum was the copilot on Snuffy Smith's plane and was killed on second Schweinfurt.

I can't answer your other questions yet, but will get at it in a few days. My desk is in such a mess now I can't find much of anything. I'm still trying to transcribe all my California material.

Sincerely yours,

9 August 1979

Dear Ken:

You wanted some information on Daniel Antonelli's four planes downed on one raid. It happened 11 Jan 44 on a mission to Halberstadt. Very rough day for the 306th

The 367th lost three out of seven planes up that day. Three of four returning were badly damaged, including Antonelli's plane, flown by ETO Loren Page, who was killed on a later mission. Antonelli is now deceased.

306th was credited with 16 destroyed, four probables and 11 damaged, and 10 other claims were disallowed.

The group put up 33 planes that day, two aborted (one mechanical, one pilot ill), five planes MIA, two were completely washed out in crash landings, none returned to Thurleigh, landing because of weather at Foulsham, Hethel, Attelbridge, Kimbolton, Deopham Green and Andrews Field.

Col. George L. Robinson, group commander, was the air commander on this date. Group flew a 19 ship group of its own and 14 as a composite with the 92nd group. Page was flying as the high squadron leader in the Robinson group.

Am off to Maxwell Sunday. Have about 10 pages of questions I need to find answers for, as well as assembling other materials. Plan to rent my own copier for the period, as the one there is such a disaster.

Sincerely yours,

23 August 1979

Dear Ken:

I went to Maxwell last week for two and one-half days, and came away with 1755 xeroxed pages of material. In fact, I had made arrangements to rent a copier from a local company, and that proved to be a real boon. I had it in the room where I was working, no one else was using it, it made better copies than their Dennison copiers, and I saved \$60 on the arrangement over what it would have cost me at 10¢ each.

I found the complete squadron histories, which are fabulous in their detail, much more so than the group diary.

I also found considerable other direct, or background, material that will either give me facts or help me understand what was happening at various times.

Had I had more time I am sure I could have found more stuff. But I think for the main part my research phase is over. There are still some serious holes, but I may be able to plug those in the future. I expect I'll sometime spend another day or two at National Archives, searching some other materials for what I need on some missions. Some of the 306th mission files are either missing or bereft of material. I also keep coming up with more stuff from bomb group members. Just yesterday got a 10-page observation on a mission from an Eighth Air Force observer who flew with the 306th. The pilot had obtained a copy, and it is the kind of thing that one would never find in a file, unless you just stumbled on it by accident.

At Maxwell also got into a bit of a debate. I wanted some 16th AF material to search for a biography which their card index said existed. It turned out, after I had looked and found, that the whole collection was supposed to be sensitive and not handed out. Guess someone got into an awful sweat about it. I told them that I never even looked at anything but the biography, but they were upset over the breach in their own security system.

At one stage they brought two truck loads of material to the office they assigned me for working--which was a great setup, as I got out of their office operation and could really concentrate on what I was about. I'm still assimilating and filing, but ought to have it all whipped by the end of the week.

There were a few things I was looking for that I couldn't find, but most of it showed up. As in any research effort, there were frustrations along the way.

But now its back to writing with a vengeance. I'm still redoing chapter 2, and will have a complete rewrite in a few days, after which its off to England and combat.

I also hope to make a flying trip before too long to Florida to see several selected people.

And, my friends out there say just ask if I need more money, and they'll send it along. So, from that aspect it looks good, too.

Haven't got your chapter back yet, but will try to do so in the next few days.

Sincerely yours,

23 July 1979

1112Grove Avenue

Radford, Va. 24141

Dear Russ;

Thanks for your comments on the chapter. I'm left with about three chapters to go and most of the footnotes. I still hope to have the manuscript finished by the end of the summer. Enclosed is the draft of the conclusion. I'd like you and George to have a look at it and if you have any comments, but especially if you have any criticisms, I hope you'll drop me a line.

Clearly the conclusion is the most important single chapter in the book, and probably the most read and most carefully read part of any book. In addition, I'm delivering a paper on the results of the bombing in the fall, which will be a condensation of the conclusion. So I'm putting a lot into that conclusion and I can of course use all the help I can get. (I must start work on that paper in early Sept., so please send any comments before then.)

Take care of yourself, and keep writing away.

Best regards,

A handwritten signature in cursive script, appearing to be the name 'Ken', written in dark ink.

CHAPTER XIV

MISSION ACCOMPLISHED: ASSESSMENT

Chronological Summary

The concept of strategic bombing developed from ideas and actions in World War I and was cultivated in the years that followed by men such as Trenchard, Douhet, and Mitchell. The proponents of strategic bombardment painted lurid pictures of devastated cities, panicked civilians, and wars being won by strategic bombardment, strategic bombing alone. The public and government leaders keenly feared a "knockout blow" and believed, in Stanley Baldwin's memorable words, that: "The bomber will always get through." Technological advances around 1930 gave bombers technological advantages that seemed to confirm the words of the bomber enthusiasts. It was in this atmosphere, that the American airmen created their distinctive strategic bombing theory at the Air Corps Tactical School. By 1935, it was refined into the concept - no doctrine, if not dogma - that unescorted, long-range, high altitude, heavily armed, fast bombers, flying tight formation in daylight, could destroy key elements of a nation's economy and thus cause that nation to collapse.

The wars of the 1930s did not confirm these notions, but they did not dispell them either. On the other hand, the value of tactical aviation (support of ground forces) was clearly shown in Spain, and in the first years of World War II in Poland, France, and Russia. But the only major and strictly air campaign, the Battle of Britain, was a triumph of the defense over the offensive, a victory of the fighter over the bomber. The explanation is that by the early 1940s, technological superiority had swung in favor of the defense with the introduction of the modern fighter and especially the introduction of radar. As a result, both the British and German efforts to bomb in daylight met with heavy losses, and both air forces switched to night operations.

These events did not phase the American airmen. They held that the Europeans were neither trained nor equipped for true strategic air operations which explained their failure. The AAF went into World War II with a unique doctrine, the B-17 and B-24 bombers armed with both large numbers of .50-caliber machine guns and the super accurate and super secret Norden bombsight, and a plan calling for the defeat of "Germany first". As long as Britain remained in the war, the American airmen would have the opportunity to apply their theory against Germany.

The Eighth Air Force was organized shortly after the U.S. entered the war, and was established in Britain in the summer of 1942. On 17 August 1942 the Eighth launched its first heavy bomber attack against Europe. But, despite considerable American effort and British assistance, operations during the fall and winter of 1942 were small. The Eighth met not only problems with weather, equipment, but the diversion of substantial numbers of men and machines to other theaters. Thus, the Eighth's first five months of operations were small, cautious, experimental, and often directed against diversionary targets. It was not until 27 January 1943, that the Eighth finally attacked Germany.

In 1943 the scale of American bombing grew in size. Likewise, German resistance and American losses increased. In the summer and fall of 1943, the American bombing theory was tested and found wanting as the Eighth's bombers suffered prohibitive losses. The Regensburg-Schweinfurt mission of 17 August and the missions in October, culminating in the second Schweinfurt mission of 14 October, clearly indicated that the theory would not work. In the month of October 1943, the Eighth lost one bomber for every 24 tons of bombs dropped, its lowest monthly figure for the war, or, put another way, ^{IT} had a loss rate of 9.2 percent of credit sorties, its highest bomber loss rate of the war.¹ German radar and fighters armed with cannon and rockets were just too much for unescorted bombers.

In response to the German defenses, the AAF introduced a number of countermeasures to increase its offensive and defensive effectiveness. Electronic countermeasures, flak vests, G-suits, chin turrets, and radar were some of these, but the most important wa

the fighter range extension program, especially drop tanks. The escort fighters and increased numerical strength, prepared the Eighth for the decisive air battle with the Luftwaffe which insured in the daylight over Europe in the first four months of 1944. While "Big Week" of 20 to 25 February and the Berlin missions beginning on 4 March epitomize the air battle, there were other missions as important and almost as costly. It was the cumulative impact of the bombing and air battle that was decisive. Both sides suffered heavy losses, but more German fighter pilots were lost than American fighter pilots, and the AAF had more resources than the GAF. By April 1944, the Eighth had won daylight air superiority. The heavy bomber was important in luring up and downing GAF fighters; however, the primary factor in defeating the Luftwaffe was the Eighth's escort fighters. Certainly other Allied airmen contributed to the Luftwaffe's defeat, but it was the loss of experienced fighter pilots over Germany to the guns of the Eighth Air Force that knocked out the GAF. As in the Battle of Britain, it was the number and caliber of the fighter pilots, not machines, that spelled the difference between victory and defeat. The GAF was beaten in the air by more than just superior numbers, it was beaten by better trained pilots and better tactics.

Other actions also contributed to the defeat of the GAF. The bombing of German aircraft factories, German airfields, and especially German oil were all important to the Luftwaffe's defeat. Of these measures, the most important was probably the attack of German aviation fuel. Curtailment of oil supplies led to the cut back of the Luftwaffe's training program which meant that whatever new pilots the Germans were able to field would be inferior to their Allied counterparts. The constant pressure on the GAF and the over-extension of the German military made the collapse of the Luftwaffe that much quicker.

Much to the airmen's regret, they could not immediately exploit the air superiority they had just won, the way they wished. For, during the spring and summer of 1944, the Eighth was involved in the direct and indirect support of the invasion. The air arm was important in making the invasion a success, but again was diverted from strategic operations. While some key German industries had been attacked prior to the summer of 1944, the full scale attack of Germany did not begin until late summer. By then the Eighth had

overwhelming numerical and tactical superiority. The Luftwaffe made strenuous efforts to reverse the tide, but new equipment and new tactics were employed in too small quantities too late in the conflict to have any impact. Meanwhile the strategic bombing attacks by the Eighth, Fifteenth, and Bomber Command effectively throttled both German industry and the German war machine. The attacks on oil and transportation were especially telling. One measure of the extent of Anglo-American air superiority is that by March 1945, the Eighth was unloading 263 tons of bombs for every heavy bomber lost, over ten times the figure of October 1943. It is important to point out that over 70 percent of the bombs fell on Germany after 1 July 1944, that is, in the last ten months of the war.² By late April 1945 the strategic bombers of the western Allies had run out of targets. In early May, what remained of the German war machine, surrendered.

Statistical Summary

While a chronological summary can give an overview of the strategic bombing campaign, it fails to indicate the intensity of it. Statistics may be boring by their very nature, but they can forcefully show the magnitude of the endeavor. A statistical summary is then another way, another cut if you will, at the same strategic air war over Europe.

The air war in World War II was first of all very costly - in men, money, and machines. Between 1942 and 1945, the AAF consisted of between 23 and 31 percent of the Army's men. In monetary terms, the air war in Europe cost the U.S. 43 billion dollars, or 24.5 percent of the American munition's budget. The entire American aircraft program alone cost 45 billion dollars.³

The result was an overwhelming Allied superiority in numbers of aircraft. The U.S. turned out almost 300,000 machines between 1940 and August 1945. The AAF did not get all of the 300,000, but did get 158,880 or 53.7 percent of those delivered. Of the 200,43

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American built combat aircraft, the AAF received 99,487 or 49.6 percent. This exceeds the 86,491 combat aircraft manufactured by the Germans and approaches the overall German production figure of 114,000. In addition, America's two Allies each outproduced Germany: the British built 124,000 aircraft and the Russians built 137,000. So, even considering Anglo-American commitments in other theaters, the Allies had an aerial superiority in Europe on the order of three to one.⁴

America's principal theater was Europe. In all, the AAF deployed the most men overseas in April 1945, 1,224,000 in number. Of these, 453,000 were assigned to the ETO and another 157,000 were assigned to the MTO, together amounting to just about half of the AAF's total overseas deployment. At its peak in July 1944, the Eighth consisted of 199,641 men. In units, the Eighth had a maximum of 15 fighter groups (from May 1944 to the end of the war) and 40 1/2 heavy bomber groups (between June and October 1944). In terms of maximum aircraft, the Eighth had 2,018 heavy bombers effective for combat in April 1945 and 1,131 fighters in November 1944. In short, the Eighth was the largest air force the AAF fielded in World War II.⁵

The scope of the air war over Europe is also revealed in the casualty figures. The AAF lost a total of 22,948 aircraft in combat during the war. Of these 11,687 (50.9%) were lost in the ETO, of which the Eighth lost about three-quarters, 9,057 aircraft missing in action, missing, and classed "E". The bulk of the Eighth's losses were bombers lost on day missions: 4,299 heavies lost and 1,556 written off as category "E". The Eighth's loss in fighters was 2,217 aircraft lost in action and 778 classed as "E". Put another way, this was an overall loss rate of 1.99 percent of bomber credit sorties and 1.23 percent of fighter credit sorties in the war.⁶

In personnel, the AAF listed 40,061 dead, 18,238 wounded, and 63,568 missing or captured. Most of these casualties were sustained in the ETO, according to AAF figures, 19,876 dead, 8,413 wounded, and 35,121 missing or captured. The most current set of statistics on losses, (1953) lists 13,088 airmen killed in the ETO, 1,449 missing in action, and 14,750 captured or interned. The Eighth Air Force wartime tabulation has 3,030 killed, 1,984 seriously wounded, and 41,442 missing in action. I have found no way

to reconcile the three sets of numbers which show a total killed and missing in the ETO of 54,997 (AAF), 48,807 (Eighth plus Ninth Air Force) and 29,287 (1953 Army). If the Eighth and Ninth Air Force statistics are compatible, then about 83 percent of the dead and 85 percent of the missing in the ETO were from the Eighth. The only further breakdown of the Eighth's losses is from the Third Air Division. That unit, which consisted of about a third of the Eighth's men and machines, and possibly a third of the losses, sustained 2,496 dead, 4,935 missing, 4,927 captured, and 217 interned.⁷

In terms of sorties, the ETO accounted for 43.8 percent of the AAF's 2,362,800 combat sorties. The Eighth's bombers flew 330,866 total sorties, of which 293,919 were credit sorties, and 266,872 were effective sorties. The Eighth's fighters logged 265,457 total sorties, 243,811 credit sorties, and 238,634 effective sorties. About 81 percent of the Eighth's fighter sorties were flown as escort.⁸

During World War II the AAF dropped 2,057,244 tons of bombs, 47 percent in the ETO. The Eighth's bombers and fighters unloaded 696,451 tons. About 47 percent of the bombs the Eighth dropped were 500-pound high explosives, 14 percent were 1,000-pound high explosives, and about 13 percent were various size incendiary bombs. The American (ETO and MTO) and British air forces battling Germany dropped 2,770,540 tons of bombs during the war, 51.1 percent on Germany. Three-quarters of the 691,470 tons of bombs dropped by the Eighth's heavy bombers fell on Germany. Of the remainder, 21.2 percent fell on France. The target system that received the most attention from the Eighth was transportation, 34 percent of the total tonnage. Military and tactical targets were hit by 12.9 percent of the bombs, while naval targets (U-boat and E-boat bases and factories, docks and ports) were hit by 5.9 percent. Aircraft factories were hit by 6.9 percent of the total, GAF airfields by 12.4 percent, and miscellaneous targets, mainly targets of opportunity, received 3.8 percent of the Eighth's bombs. Oil targets were hit by 10.7 percent of the bombs while other industrial plants received 13.4 percent of the total.⁹

During the course of the war, the AAF claimed the destruction of 40,259 enemy aircraft in the air and on the ground. Almost 51 percent of these were registered in the ETO. The Eighth claimed a total of 11,481 aerial victories, 6,259 by the bombers, and 5,222 by the fighters. Almost 81 percent of the Eighth's bomber and 86 percent of the fighter claims were either FW 190s or Me 109s. The bombers logged more Focke Wulfs destroyed than Messerschmitts destroyed (49.6%:31.2%), while the Eighth's fighters scored in just the reverse proportion, 37.3 percent FW 190s and 48.6 percent Me 109s. In all, the Eighth claimed the destruction of 5,055 FW 190s and ~~4,490~~ 5 Me 109s in the air. In addition, the Eighth's fighters claimed 4,250 aircraft destroyed on the ground. To log these claims, the Eighth's bombers expended 72.3 million rounds of .50-caliber ammunition while the fighters used up 26.6 million rounds of .50s on combat missions. If the claims are anywhere close to accurate, it took over 11,000 rounds of .50s fired by the bombers and over 5,000 rounds fired by the fighters for each aerial credit. The Eighth used about 21 percent of the AAF's total ammunition consumption, while running up 39 percent of the AAF's total aircraft victories, and 41 percent of the AAF's aerial victories.¹⁰

Analysis

Regardless of how it is told, the story of the Eighth is a success story. The unit was given a mission, and, against a resolute enemy and other obstacles, carried out that mission. In so doing, the Eighth adapted to the situation in terms of equipment and tactics: simply, it met the challenge of combat and won. Five sets of factors affected the Eighth's part in the air war over Europe: weapons (aircraft, new equipment, and modifications), organization (tactics and techniques), men (crew and leaders), decisions above the Eighth, and non-military factors (geography and weather).

American aircraft were well suited for the ^{war.} Their design enabled American industry to produce them in great numbers, free of major faults, and adequate

for both the level of crew skill and combat. Although the different aircraft had various virtues and vices, advocates and detractors, they served as hedges against failures of each other. All were versatile enough to perform beyond the original intentions of their designers and their initial capabilities,^{as} constant modifications fitted them for battle conditions. The addition of Tokyo tanks, center nose guns, and chin turrets increased bomber performance in the same way that drop tanks, higher octane fuel, and bubble canopies aided the fighters. American day heavy bombers were in a class by themselves, while American fighters more than held their own against the Luftwaffe. New gunsights and ammunition also helped the gunners, as electronic devices improved navigation, bombing, and protection. Armor and flak curtains were added to protect the aircraft, while flak, electrically heated, and "G" suits were developed for their personnel.

The Eighth was aided not only by technology but by organization and training. Elaborate procedures were devised to allow vast armadas of aircraft to take off, assemble, find their targets, bomb them, and return home and land. Other aids for the heavy bombers included the use of weather and air scouts. Crew inexperience was a major problem, a problem aggravated by rotation policies and casualty rates. But rotation, along with other measures taken to provide for crew comfort in England, was necessary to uphold aircrew morale ^{IN FACE OF} high attrition. ^{THE ROTATION POLICY & HIGH LOSSES,} In combination with the crews' limited experience, continuous operations, and the difficult conditions met in battle over Europe, ^{INCREASED} the problems of navigation, bombing, and gunnery, and rendered a number of missions ineffective. To meet the experience problem, group bombing evolved into the use of lead crews. These specially selected, trained, and qualified airmen raised the level of the Eighth's performance and helped ameliorate the problems of crew inexperience. New formations and new organizations evolved to handle the large numbers of aircraft. Deceptive routing, feints, multiple approaches and shuttle bombing were other tactics used to facilitate bombing. With the decline of the GAF fighter arm, emphasis shifted from the defense against fighters toward defense against flak. Throughout constant efforts were made to increase bombing

accuracy. Fighter tactics were modified, especially with the steady extension of range and the loosening of the escort in early 1944. Strafing developed into a major fighter tactic and was used effectively, although at a considerable cost. A major factor in developing these techniques were ^{REPORTS FROM} civilian experts in the Operations Research Sections.

The Eighth's aircrews showed skill, discipline, and courage, especially the latter. At the same time, the ground crews supported the operation and conquered ground and repair difficulties of an unparalleled magnitude. ^{AND} It must be remembered these men were recent civilians thrust into the most demanding combat theater of the air war. The Eighth's leaders were very important in bringing about the Eighth's victory. They took untried doctrine, equipment, and men into the most critical air battle in the war and beat the enemy. The bombers were frequently led by their division, wing, and group commanders. General Kepner, for example, flew 14 bomber and 10 fighter missions, and General Travis flew at least 17 bomber missions. The Eighth lost two Brigadier Generals in combat. Just as important as the personal leadership, ~~WERE~~ ^{AND} the day-to-day decisions of the Eighth's leaders that frequently risked the unit to the GAF and the weather. ¹¹

The last two categories of factors that affected the Eighth, decisions above the unit and non-military factors, need to be mentioned but only briefly. Military decisions in Washington determined the Eighth's targets, resources, and mission. Likewise, non-military aspects such as geography and weather, were outside the airmen's control, yet had to be worked around. The Eighth did just that and accomplished its mission at a low cost in American lives.

One way to highlight the Eighth's successes is to compare and contrast it with the GAF's failures. For whatever were the Eighth's problems, they were minuscule in comparison with those of the Germans. Moreover, whatever were the Eighth's responses to the Luftwaffe, the response of the GAF is even more open to criticism. German equipment was good and there was relatively little difference between the opponents' weapons. Although the German war industries supplied adequate, and in some cases superior weapons (and rocket aircraft, for example), they were never enough to overcome either Allied

numbers or pilot quality. In the west, the GAF was unable to successfully meet all three strategic aerial threats, American day bombers, British night bombers, and American escort fighters. German production failed because of high level decisions and Anglo-American bombing. Luftwaffe equipment in the field and on the drawing boards could not solve Germany's aerial problems or seriously dispute Allied air superiority, much less regain it. What counted in the end and what decided the battle for the air was the training, numbers, and weapons of the men actually in combat. For "it is just as essential not to use the unready weapons of the next war as it is not to use the outclassed weapons of the last."^{11a} The Germans fell into this trap, the western Allies did not.

Luftwaffe tactics were even less satisfactory when compared with the Eighth's. The insistence on particular tactics (tail attacks, for example) and tactical rigidity hamstrung the GAF. Twin-engine fighters armed with large caliber cannon and rockets, was the solution to unescorted bombers, but proved^a costly failure when faced with escort fighters. Air-to-air bombing, rockets, and ramming were inadequate solutions. While some criticize the GAF's failure to meet the Eighth Air Force at the coast, the failure to exploit intruder tactics is a much more clear cut mistake.

GAF leadership at the upper levels was weak. Hap Arnold believed that German blunders materially contributed to the Allied victory. Or, as Bomber Harris so well put

The Germans never made a small mistake, because they are cautioned against all small mistakes in their manuals, without reference to which they seldom do anything whatever. But they can always be relied upon to make all the imaginable large and catastrophic mistakes, together with a good many that only a German could think out.

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Considering some of the disasterous German decisions, this description is apt. The failure to build up the Luftwaffe sooner and to capitalize on the jets were both large blunders. But undoubtedly the decisive mistake dealt with the pilot training program.

The failure to expand the program early in the war, the later decision to cut flying hours ^{ALONG WITH} attrition, left the GAF with a numerically and qualitatively inferior pilot corps. For it was superior Allied numbers, but most of all, superior Allied fighter pilot quality that defeated the Luftwaffe.

German political decisions were even worse. The greatest mistake was, of course, to get involved in a war on three land fronts, western Europe, Italy, and Russia, against America, Britain, and Russia at the same time. Failure to quickly and fully mobilize the German economy was another colossal mistake. Both Hitler and Goering intervened with the GAF, much to its detriment. In short, the Luftwaffe played a weak hand, poorly.

Relative to the Eighth, the GAF had less resources, greater commitments, made more and worse errors, and made inadequate tactical adjustments to the tactical situation. It was beaten by superior quantity and quality. The Luftwaffe was strapped by a three-front air war and was unable to meet the three aerial threats in the west. A comparison of the Eighth's and the GAF's tactical development indicates that although the opponents' weapons were relatively equal, the Eighth's tactics worked, the German's did not. The decisive tactical difference was the Eighth's decidedly superior leadership and crew quality. In addition the Eighth had both better support and high level direction. Unlike the GAF, the Eighth made the necessary modifications of equipment, doctrine, organization, tactics, and training that were required. These changes, the tactical evolution, were the elements of victory. This tactical development was as remarkable as the Eighth's major contributions to the war effort.

Results

The impact of the air war against Germany was massive and many faceted. The often quoted conclusion of the United States Strategic Bombing Survey remains the most authoritative summary of that effect:

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Allied air power was decisive in the war in western Europe.

Hindsight inevitably suggests that it might have been employed differently or better in some respects. Nevertheless, it was decisive. In the air, its victory was complete; at sea, its contribution, combined with naval power, brought an end to the enemy's greatest naval threat--the U-boat; on land, it helped turn the tide overwhelmingly in favor of Allied ground forces. Its power and superiority made possible the success of the invasion. It brought the economy which sustained the enemy's armed forces to virtual collapse, although the full effects of this collapse had not reached the enemy's front lines when they were overrun by Allied forces. It brought home to the German people the full impact of modern war with all its horror and suffering. Its imprint on the German nation will be lasting. 13

Before discussing the specific results of the bombing campaign it must be made clear that the air war was waged by American, British, and Soviet airmen against Germany on three geographic fronts. The AAF was engaged against Germany in two of these fronts, what were designated the ETO and MTO. Within the ETO the two principal strategic bombing forces were the ^{AAF's} Eighth Air Force and RAF's Bomber Command. The other major American air force in the ETO besides the Eighth was the Ninth Air Force, the American tactical air force, _{NO TP}

All of these air forces contributed to the defeat of Germany, and it is difficult and often times impossible to sort out exactly which result was caused by which air force. The first caveat therefore, is that no one air force did all the damage, and no one air force was exclusively responsible for any specific result.

The most important consequence of the air war against Germany was the defeat of the German Air Force. While there may be some controversy concerning other aspects of the air war, no objective observer can doubt that the Luftwaffe was clearly defeated by the Allied airmen. The important of this defeat is that it permitted the air war and the ground

war to be fought to the advantage of the Allies, a huge advantage indeed. It must be recalled that the GAF and the tank were the two major elements comprising the Blitzkrieg which gained Germany its early, astonishing, and spectacular successes. Because of the GAF's power and the potential of air power, the primary mission assigned to the Anglo-American air forces was to gain air superiority in time for the cross channel invasion. This feat was accomplished chiefly by the Eighth Air Force. The consequences of Allied air superiority were many fold. First, Anglo-American soldiers in Europe seldom saw German aircraft and were even less likely to have been attacked by them. Unlike the situation in 1940, in 1944 and 1945 the western Allied armies were fighting under friendly skies. The possession of air superiority also allowed the strategic air war to be fought to the advantage of both the day and night bombers.¹⁴

The second major impact of the air war also had direct military consequences for the Anglo-American ground soldiers. Air attacks on German transportation and oil severely restricted the mobility of the German army. The destruction of rail and road bridges, the demolition of communication centers, and the attack on German reinforcements hampered the German response to the ground armies of the Allies. One reason the Blitzkrieg had been so successful was that the German army moved faster than its opponents. In 1944 and 1945, the opposite was the case. While strategic bombers cut oil and rail supplies, the tactical aircraft made a more direct contribution to the progress of the land forces. Allied aircraft, mostly tactical aircraft, hit the German forces constantly bringing overwhelming firepower to bear, easing the way for the ground forces. The key weapon in this regard was the versatile fighter bomber.

The third major contribution of the air offensive was to divert German resources from offensive operations to defensive operations. Defensive fighters were built, not offensive bombers. The strategic bombing offensive tied down vast amounts of German resources. Possibly one million people were involved in flak defense, while another one to two million were engaged in repair activities. In addition, large percentages of resources were required by the Germans to defend their homeland. Albert Speer, the brilliant German industrial organizer estimated that in 1944 30 percent of German artillery production, 20 percent of

heavy caliber ammunition, 50 to 55 percent of electronics, and 33 percent of optics were used in air defense. Had the strategic air war not been waged, most of these resources would have been available for use against Allied ground forces.¹⁵

The fourth major result of the air war was its adverse effect on the German economy. Bombing did have a considerable impact on the German economy, although this impact was not decisive. Albert Speer states that the bombing in 1944 cost the Germans 30 to 40 percent of their production.¹⁶ The Eighth's precision bombing, especially of oil, played a major role in smothering German production. And the equipment that the Germans were able to produce was not of the best quality, for the Germans emphasized quantity over quality. Short engine life, bursting gun barrels, and outdated equipment went along with expanded volume production. Most important, considerable amounts of this production never reached the troops. Some was destroyed by the bomber enroute to the front, while some could not be used because of transportation and fuel problems. What counts, in the end is how much and how good is the materiel that gets into the hands of the troops. In this sense then, the strategic bombing of Germany had a profound overall impact on the war.

Criticisms

But the strategic bombing offensive was not conducted without errors. Criticisms of the bombing has been particularly sharp, and while some of the criticisms are well founded others are emotional nonsense, sometimes revealing more about the writer and the times than about the bombing. American use of firepower, especially air power in Korea and most of all in Vietnam, has fueled the criticisms of the World War II bombing. How substantial are these criticisms? What criticisms can be made of the World War II bombing of Germany? That is, what does a hard look at the strategic bombing offensive against Germany 30 years later reveal?

First, the bombing did not win the war. Despite the claims of some of the aviation proponents before, during, and since the war, air power did not single-handedly defeat the Germans. Douhet's prophecies did not come to pass in World War II. Bombing in World War II proved that the effects of conventional bombs on physical and psychological targets were overestimated in the prewar years. While both targets were damaged by the strategic bombing, neither collapsed before the Allied ground forces defeated the German army in the field. Victory in Europe was gained not by strategic bombing alone, but by the combined efforts of the three major Allies; Britain, America, and Russia, AND by combined arms; air, land, and sea. Regardless of what some aviators would like to have done, the air offensive was never intended to defeat Germany. In that sense, because of the assigned goals, the/allotted resources, and the targets chosen, strategic air power was never tested against Germany in World War II. It is pointless to speculate what might have happened. The leaders who decided against strategic bombing as the primary weapon against Germany, undoubtedly had at least two good reasons in mind. First, air power was untried, to stake all on its success would be a great gamble while there were traditional means available. Second, if air power was successful, the political effects of Germany surrendering without an Anglo-American presence on the continent was unthinkable. Their decision was a safe and sure one, and won.

A second criticism is lack of effectiveness of the bombing. The critics point to the fact that the German war production peaked in the summer of 1944, despite the strategic bombing. This assertion requires study and analysis as the facts are correct, but not the implication. It must be emphasized that the Americans and British misread the German economy and did not realize that the Germans had not fully mobilized until late in the war. Therefore the German economy was not stretched early in the war as the Anglo-American airmen believed. So the first result of the strategic bombing was to take up this slack in the economy. A second factor that helps explain the amazing German war production is the targets the bombers actually hit. About one-quarter (25.2%) was dumped on industrial areas (cities) and almost one-third (31.6%) on land transportation targets. Military targets, V-weapons, naval and port targets were hit by a sixth (16.9%) of the total tonnage. Manufacturing targets,

excluding the bombing of cities, were hit by only one-sixth of the bombs (14.1%).¹⁷ The Eighth's record shows much more effort directed against the specific industrial targets, 31 percent of its total tonnage and 38.7 percent of the bombs it dropped on Germany.¹⁸ The point is that well over half of the total bombing effort of the western Allies directed against Europe, and specifically against Germany was aimed at targets other than industrial. Further, most of the bombs fell late in the war. Only 18.2 percent of the bombs dropped on Germany fell before January 1944, and only 41 percent were dropped prior to 1 October 1944. Half of the Eighth's total tonnage was dropped after 1 August 1944 and half of the Eighth's tonnage against Germany fell after 1 November 1944.¹⁸ What this means is that the strategic bombers were unable because of strategic and tactical reasons from throwing their full weight against Germany until relatively late in the war. Little wonder, then, that Germany munitions production peaked in the summer of 1944. Once the Anglo-American strategic bombers began full scale bombing of German targets, especially oil and transportation, the results were dramatic.

The third major criticism of the strategic bombing, is that the resources put into it could have been more profitably used elsewhere. The underlying assumption of this criticism is that the bombing achieved little and that an alternative employment of these resources could have achieved more. All the other claimants are mentioned: sea power, ground power, landing craft, and tactical (ground support) aviation.¹⁹ While it is impossible to effectively argue against a hypothetical, some counter arguments can be made. Despite the "Germany first" pledge, the western Allies never threw their full weight against Germany in World War II. The war was also fought against Japan and fought on a number of fronts. Although the European theater had priority over the other theaters, scarce resources were drained off to these other areas. Strategic aviation was not alone in building up slowly in World War II; the entire buildup by the Allies was slow. While the strategic bombing offensive did not fully open up until mid-1944, it will be recalled that the cross channel invasion was not launched until June 1944. It is unclear that building fewer bombers would have pushed forward the date of the invasion. The case can be made that less attention to strategic bombing, especially day bombing, would have made the invasion more difficult. As already

mentioned, the chief accomplishment of the air war was to win air superiority. How could air superiority have been won without the day bombers luring up the GAF fighters to be knocked down by the escort fighters? In my view, there was no other alternative, certainly not one that would have achieved quicker or cheaper results. For air superiority was won, not by sea power, not by ground power, landing craft, or tactical (ground support) aviation, but by the heavy bombers and long range escort fighters of the Eighth Air Force. And, air superiority was vital to successfully conducting the cross channel invasion, and essential to achieving victory, overall victory, as cheaply as possible.

A fourth criticism of the strategic bombing offensive is the great destruction it caused. This criticism is summed up by the great military historian B.H. Liddell Hart: "Air power is more destructive than decisive."²⁰ Between 300,000 and 600,000 German civilians were killed by Anglo-American bombs during the course of the war as well as 58,000 French civilians. Twenty percent of Germany's dwelling units, 3.6 million in all, were destroyed, rendering 7.5 million people homeless. Berlin was pounded by 49,400 tons of bombs by Bomber Command alone, which along with the Eighth's bombs destroyed about one-third of the city's 6,427 acres of builtup area. In the course of the 363 attacks on the German capital, about 50,000 Berliners were killed (compared to 60,000 British killed in the entire war by German bombs and missiles), and 39.2 percent of the original homes in the city were destroyed.²¹

Morality aside, that is an issue more suitable for philosophers and theologians, was all the death and destruction justified? (Is this question a proper one, either after such a conflict or more to the point, during such a conflict?) In any case, for most, the bombing of factories is one thing, the blind bombing of cities is something else. In the cool luxury of hindsight, it is easy to criticize the policy of Bomber Command and its commander, Arthur Harris, that it was better to bomb than not to bomb.²² It should be remembered, however, that between June 1940 and June 1944 the only offensive weapon the western Allies possessed was strategic air power. While the issue of ends justifying the means can surely be raised, there should be no mistake regarding the system the Allies were fighting in World War II. But the question of means also applies to the Eighth's use of blind bombing.

While radar bombing of cities during non-visual weather brought up the Luftwaffe and forced the German flyers to fight at a disadvantage, the question is: was the military gain worth the destruction wrought? But, even if the Eighth's decision in this case can be justified, what of the Eighth's continued use of blind bombing after the GAF was beaten? A shade less than half of the Eighth's ^{TONNAGE} bomb (49.7%) was aimed by non-visual means.²³ This occurred despite the pre-war theory and despite the American criticism of the British night area bombing. In view of these statistics, it appears that the Eighth's leaders agreed with Bomber Harris, that it is better to bomb than not to bomb. Such an attitude fostered blind bombing and contributed to the massive death and destruction, while its contribution to winning the war is certainly open to question.

Related to this criticism is the lack of coordination of the bombing offensive. Essentially the American and British waged two separate wars against the German homeland, with only a nod toward cooperation. Tactical considerations encouraged this tendency, as did the minimal coordination between the Anglo-American strategic bombers and even between the two AAF strategic bomber strategic air forces, the Eighth and the Fifteenth. Thus, the strategic bombing, regardless of its intent, became more a sledgehammer than a scalpel.

Even more substantial criticisms can be made on the tactical level. Clearly, the prewar American bombing theory of high altitude, unescorted, tight formations of self-defending bombers was shot to pieces over Germany. Not until funeral pyres of men and machines dotted the European landscape in mid and late 1943 did the American airmen make the adjustments mandated by the introduction of radar and the modern fighter. The most costly of the errors was to insist on unescorted operations. The theorists were wrong in forecasting decisive air action without first gaining command of the air, for air superiority was the key to all air operations and most land and sea actions in World War II. How many victories were won against forces with air superiority? Until well into the war, it appeared to most airmen of all countries that an aircraft having both bomber range and fighter performance could not be built. Thus, the American airmen were faced with the options of either not conducting strategic operations or conducting them unescorted. The AAF opted for the latter, despite growing reservations about the bomber's ability to survive unescorted,

beginning even before the war, and suffered the consequences. Only the innovation of the drop tank and later long range fighters, especially the P-51, were able to redeem the situation in 1944. But it was a costly and very closely run operation.

If the "can do" spirit and technological state of the art partially ameliorated the criticism of the AAF leaders for the lack of escort fighters from the outset of the bombing campaign, the same can not be said of the neglect of bomber defense measures. Despite the B-17's nickname "Flying Fortress", the great press accounts of numerous machine guns, and the American bombing theory, the bombers were deficient in defensive armament. The Americans were woefully tardy in fitting power turrets to their bombers, something other countries did years before. Not only was the gunnery technology neglected, so was gunnery training. It was not until after the U.S. entered the war that gunnery schools were established. It would appear that the AAF believed its own press and was awed by the number of .50s its bombers carried, resulting in a tragic neglect of flexible gunnery. While the B-17 armed and manned as it was in the 1930s might have been adequate against the fighters of that decade, it proved inadequate against radar and modern fighters of the 1940s. Technological advances shifted the advantage away from the bomber and the offensive, toward the fighter and the defensive.

Another reason why the unescorted bombing theory floundered, was that the crews who fought the air war against Germany were much different than those that developed the theory over the U.S. Although American flight crews were eventually to have more training than their opponents, they still did not have sufficient training to fly the tight formations, bomb or shoot with the accuracy required to make the American theory of bombing work. The system of rotation, although necessary to maintain morale, was another factor that diluted crew experience.

Limited bombardier training and experience was one factor that was responsible for poor bombing accuracy. Certainly the bombardiers that actually dropped the bombs on Europe did not have the same training and experience as did those in the 1930 regular air arm. Conditions over wartime Europe were much different than those over peacetime Texas.

There was first and foremost the matter of enemy opposition. Hostile flak and fighters were at the very least, distracting. One study indicates that bombing accuracy under fire was only 10 to 20 percent of what it was without opposition.²⁴ Another difficulty was weather. The American bombing theory was predicated on seeing the target; something that the weather over Europe often did not permit for days and weeks. Bombing studies showed a direct and dramatic correlation between the amount of cloud cover and the resulting accuracy. These three factors, then, wartime crews, German opposition, and European weather were a major part of the reason why the U.S. bombing did not come close to the prewar estimates and that unfortunate phrase: "pickle barrel accuracy".

Another area in which the AAF must be taken to task is bomber modifications. Although the modifications in general were adequate, the modification programs did not pay sufficient attention to the safe return of the bombers. In the interests of production volume, short cuts were taken, some devices removed and other devices not fitted to the bomber that would have increased the aircrafts' chances of survival. Specifically, the AAF deleted emergency means of feathering disabled engines, provided inadequate means to extinguish fires, and only tested engine armor. Any of these measures would have decreased the vulnerability of the bombers and increased the number of American bomber crews that would have made it home. The gain in morale and reduced crew attrition would have been weighty arguments had the AAF carefully studied these issues.

One of the most criticized aspects of the Eighth's performance was that of targets. As already noted, the Eighth was constrained by both high level direction and by weather as to what targets could and could not be hit. Nevertheless, targetting can still be criticized. Good intelligence, always difficult to obtain, proved both especially difficult to get and important in industrial matters. The attack on the bearing industry was launched before the industry could be taken out. The target was indeed vulnerable and vital, but not as crucial as the Anglo-American airmen believed at the time. In the attacks on the aviation industry, the airframe plants were hit, not the more important aircraft engine factories. German production is mute testimony to the error of that judgement. At least three critical industries were not directly attacked. Postwar investigation shows that both

chemicals and electrical power were extremely vulnerable and their destruction would have had rapid and dire impact on the German war machine. A third industry, ethyl fluid, was small yet vital. It produced an ingredient^{necessary} to the production of high octane gasoline which high performance piston engines require. Yet, this industry was never bombed.²⁵ Oil and communications proved to be key targets and their attack did have widespread effects. But even in these attacks, the western Allies frequently selected the wrong aiming points.

Finally, the airmen did not reattack the targets as often as necessary. Damage was overestimated, as normally buildings were more heavily damaged than the machines they housed. The Germans proved to be both ingenious and tenacious in repairing bomb and fire damage. It was the constant attack and reattack, the cumulative effect of the bombing that had the long term debilitating effect on the Germany nation. This was an intelligence failure, and the part Ultra played in this failure has yet to be assessed.

Some may criticize the AAF for not employing the B-29 in the European theater. Certainly the aircraft's marked superiority over the B-17s and B-24s would have increased the Eighth's fighting power. But the Superfortress had development problems and did not get into combat until mid-1944. By then, the air war over Europe had been won. Certainly the decision to go ahead and fight the air war with the weapons on hand was correct, for after 1944, increased bomber efficiency was not a crucial item as it had been prior to that time. Furthermore, even had the B-29 been ready earlier, it could not have stood up to the German jets alone, as Mig-15s over Korea proved a few years later.

A final tactical criticism is the Eighth's policy of fighter strafing. In the fight for air superiority in early 1944, strafing was a costly but effective tactic. The policy of permitting victory credits for aircraft destroyed on the ground encouraged the Eighth's pilots and did result in the destruction of large numbers of GAF aircraft on and near their airfields and a deterioration of Luftwaffe morale. Later, strafing was an appropriate tactic against German jets. But after air superiority was achieved, and against targets other than German jets, the tactic resulted in heavy losses for little real gain. German flak was effective, and very effective against low-flying aircraft. The Eighth Air Force lost some of its best pilots in strafing attacks. It must again be emphasized that the

Luftwaffe had more aircraft than it could use; it was the loss of trained fighter pilots that defeated the GAF. For the most part, strafing did not hit the correct target, while it was very costly.

In summary, then, the overall assessment of the American strategic bombing offensive against Germany is a positive one. The Eighth Air Force adapted well to the combat situation. The impact of the bombing was important in winning overall ^{ALLIED} victory, and not only winning, but winning sooner and cheaper than otherwise might have been the case.

The limited wars America has fought since 1945 should not diminish the accomplishment of American arms in World War II. In that war, America had a clear goal, a noble aim: to defeat a cruel, threatening, barbarism. The Eighth Air Force had a definite mission and did its part by clearly accomplishing its mission. It was accomplished by the Eighth's airmen with skill and courage. It was a proud achievement. It was then, and in retrospect, still is.

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5. AAF Stat. Digest,33; 8AF Stat. Summary,7,11-15.
6. AAF Stat. Digest,254; 8AF Stat. Summary,16,29.
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8. AAF Stat. Digest,220; 8AF Stat. Summary,17.
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11. General Charles P. Cabell to author, 31 Jan. 1969; General William Kepner to author, 13 Feb. 1969.
- 11A Arthur Harris, Bomber Offensive (London,1947),32.
12. Ibid, 42; Henry H. Arnold, Third Report of the Commanding General of the Army Air Forces to the Secretary of War, 12 Nov. 1945 [Walter Millis, The War Reports of General of the Army George C. Marshall, General of the Army H.H. Arnold, and Fleet Admiral Ernest J. King (Philadelphia,1947),453.
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- 15.Ira C. Eaker and Arthur G.B. Metcalf,"Conversations with Albert Speer,"Air Force (Apr. 1977), 54; Interrogation of Reichminister Albert Speer, Section IV,A-7,4[AF519.601B-4]; Interrogation

of Albert Speer, former Reich Minister of Armaments and War Production, 18 July 1945 [Charles Webster and Noble Frankland, Annexes and Appendices, vol. IV, The Strategic Air Offensive Against Germany, 1939-45, History of the Second World War, James Butler (ed.) (London, 1961), 383]; Burton H. Klein, Germany's Economic Preparations for War (Cambridge, 1959), 227.

16. Interrogation of Reichminister Speer, 4.

17. USSBS, Appendix, 49-59.

18. 8AF Stat. Summary, 38, 39, 46, 47.

19. USSBS, Appendix, 13; 8AF Stat. Summary, 47.

20. Gerald Dickens, Bombing and Strategy (London, 1949), 24; J.F.C. Fuller, The Second World War (N.Y., 1948), 219; P.M.S. Blackett, Fear, War and the Bomb (N.Y., 1948), 15 quoting Gifford Martell, The Russian Outlook; Marshall Andrews, Disaster Through Air Power (N.Y., 1950), 7; B.H.L. Hart, History of the Second World War (N.Y., 1970), 591; Stephen E. Ambrose, "Was the Bombing of Germany Worth the Cost? No.," American History Illustrated (Apr. 1970), 9, 10. The only balanced appraisal of the bombing offensive, and probably the best one volume work, is Anthony Verrier, The Bombing Offensive (N.Y., 1968).

20. B.H.L. Hart, "Some Lessons of the European War," Yale Review (Mar. 1945), 420, 421.

21. Hans Rumpf, The Bombing of Germany (N.Y., 1961), 125, 126, 128; USSBS, Over-all Report, 72, 95; Leonard Bridgman (ed.) Janes All the World's Aircraft 1945/6 (London, 1946), 30a.

22. Webster and Frankland, III, 82. The issue of civilian morale as an objective of the bombing campaign is more properly discussed with either the overall bombing policies or even more clearly the history of Bomber Command, not the Eighth Air Force. Morale was lowered by the bombing, but at a terrible cost to both airmen and civilians. See, USSBS, Over-all Report, 95-99.

23. 8AF Stat. Summary, 21.

24. Minutes Flak Conference, 1-11 June 1945 [Lvn N10287].

25. USSBS, Over-all Report, 22, 36, ⁴⁵84, 85; MAAF, Air Surrender Documents [Lvn N10306]; Verrier, Bomber Offensive, 317-319; Harris, Bomber Offensive, 234.



December 10, 1979

Mr. WM M. Collins
2973 Heatherbrae DR
Youngstown, OH 44514

Dear Mr. Collins:

I am writing you as a contact for the 8th Air Force Historical Society. I hope you saw the item in the latest issue of the 8AF News (November 1979, p.3), which noted that I am compiling a bibliography on the Eighth for the 8AF Memorial Museum Foundation. Besides listing published and unpublished materials, I am planning to include three other features. First, an up-to-date list of Eighth Air Force unit histories (published, unpublished, and in progress). Second, I intend to list works related to the Eighth's history which are in progress (such as on aircraft, station life, E & E, Air Sea Rescue etc.). Third, I plan to include a list of museums and exhibits featuring material related to the Eighth's history.

To successfully include these three features, I need all the assistance I can get. You can help by completing and returning the enclosed form. In addition, any and all comments are welcome; I especially would like your opinion on materials that are particularly useful on the history of the Eighth. If your unit has a newsletter, I would be most grateful if you would run an item asking your members for their help on this project in general, and on these three items in particular.

An up-to-date, accurate, and complete Eighth Air Force bibliography will be valuable to all those interested in the Eighth's history. With the help of you and others like you, I firmly believe that I can produce such a work.

I wish to thank you in advance for your help on this project.

Yours truly,

Kenneth P. Werrell
Associate Professor of History

KPW/1h

Enclosures

23 July 1979

1112Grove Avenue

Radford, Va. 24141

Dear Russ;

Thanks for your comments on the chapter. I'm left with about three chapters to go and most of the footnotes. I still hope to have the manuscript finished by the end of the summer. Enclosed is the draft of the conclusion. I'd like you and George to have a look at it and if you have any comments, but especially if you have any criticisms, I hope you'll drop me a line.

Clearly the conclusion is the most important single chapter in the book, and probably the most read and most carefully read part of any book. In addition, I'm delivering a paper on the results of the bombing in the fall, which will be a condensation of the conclusion. So I'm putting a lot into that conclusion and I can of course use all the help I can get. (I must start work on that paper in early Sept., so please send any comments before then.)

Take care of yourself, and keep writing away.

Best regards,

A handwritten signature in cursive script, appearing to read "Ken". The signature is written in dark ink and is positioned below the typed text "Best regards,".

CHAPTER XIV

MISSION ACCOMPLISHED: ASSESSMENT

Chronological Summary

The concept of strategic bombing developed from ideas and actions in World War I and was cultivated in the years that followed by men such as Trenchard, Douhet, and Mitchell. The proponents of strategic bombardment painted lurid pictures of devastated cities, panicked civilians, and wars being won by strategic bombardment, strategic bombing alone. The public and government leaders keenly feared a "knockout blow" and believed, in Stanley Baldwin's memorable words, that: "The bomber will always get through." Technological advances around 1930 gave bombers technological advantages that seemed to confirm the words of the bomber enthusiasts. It was in this atmosphere, that the American airmen created their distinctive strategic bombing theory at the Air Corps Tactical School. By 1935, it was refined into the concept - no doctrine, if not dogma - that unescorted, long-range, high altitude, heavily armed, fast bombers, flying tight formation in daylight, could destroy key elements of a nation's economy and thus cause that nation to collapse.

The wars of the 1930s did not confirm these notions, but they did not dispell them either. On the other hand, the value of tactical aviation (support of ground forces) was clearly shown in Spain, and in the first years of World War II in Poland, France, and Russia. But the only major and strictly air campaign, the Battle of Britain, was a triumph of the defense over the offensive, a victory of the fighter over the bomber. The explanation is that by the early 1940s, technological superiority had swung in favor of the defense with the introduction of the modern fighter and especially the introduction of radar. As a result, both the British and German efforts to bomb in daylight met with heavy losses, and both air forces switched to night operations.

These events did not phase the American airmen. They held that the Europeans were neither trained nor equipped for true strategic air operations which explained their failure. The AAF went into World War II with a unique doctrine, the B-17 and B-24 bombers armed with both large numbers of .50-caliber machine guns and the super accurate and super secret Norden bombsight, and a plan calling for the defeat of "Germany first". As long as Britain remained in the war, the American airmen would have the opportunity to apply their theory against Germany.

The Eighth Air Force was organized shortly after the U.S. entered the war, and was established in Britain in the summer of 1942. On 17 August 1942 the Eighth launched its first heavy bomber attack against Europe. But, despite considerable American effort and British assistance, operations during the fall and winter of 1942 were small. The Eighth met not only problems with weather, equipment, but the diversion of substantial numbers of men and machines to other theaters. Thus, the Eighth's first five months of operations were small, cautious, experimental, and often directed against diversionary targets. It was not until 27 January 1943, that the Eighth finally attacked Germany.

In 1943 the scale of American bombing grew in size. Likewise, German resistance and American losses increased. In the summer and fall of 1943, the American bombing theory was tested and found wanting as the Eighth's bombers suffered prohibitive losses. The Regensburg-Schweinfurt mission of 17 August and the missions in October, culminating in the second Schweinfurt mission of 14 October, clearly indicated that the theory would not work. In the month of October 1943, the Eighth lost one bomber for every 24 tons of bombs dropped, its lowest monthly figure for the war, or, put another way, ^{IT} had a loss rate of 9.2 percent of credit sorties, its highest bomber loss rate of the war.¹ German radar and fighters armed with cannon and rockets were just too much for unescorted bombers.

In response to the German defenses, the AAF introduced a number of countermeasures to increase its offensive and defensive effectiveness. Electronic countermeasures, flak vests, G-suits, chin turrets, and radar were some of these, but the most important was

the fighter range extension program, especially drop tanks. The escort fighters and increased numerical strength, prepared the Eighth for the decisive air battle with the Luftwaffe which insured in the daylight over Europe in the first four months of 1944. While "Big Week" of 20 to 25 February and the Berlin missions beginning on 4 March epitomize the air battle, there were other missions as important and almost as costly. It was the cumulative impact of the bombing and air battle that was decisive. Both sides suffered heavy losses, but more German fighter pilots were lost than American fighter pilots, and the AAF had more resources than the GAF. By April 1944, the Eighth had won daylight air superiority. The heavy bomber was important in luring up and downing GAF fighters; however, the primary factor in defeating the Luftwaffe was the Eighth's escort fighters. Certainly other Allied airmen contributed to the Luftwaffe's defeat, but it was the loss of experienced fighter pilots over Germany to the guns of the Eighth Air Force that knocked out the GAF. As in the Battle of Britain, it was the number and caliber of the fighter pilots, not machines, that spelled the difference between victory and defeat. The GAF was beaten in the air by more than just superior numbers, it was beaten by better trained pilots and better tactics.

Other actions also contributed to the defeat of the GAF. The bombing of German aircraft factories, German airfields, and especially German oil were all important to the Luftwaffe's defeat. Of these measures, the most important was probably the attack of German aviation fuel. Curtailment of oil supplies led to the cut back of the Luftwaffe's training program which meant that whatever new pilots the Germans were able to field would be inferior to their Allied counterparts. The constant pressure on the GAF and the over-extension of the German military made the collapse of the Luftwaffe that much quicker.

Much to the airmen's regret, they could not immediately exploit the air superiority they had just won, the way they wished. For, during the spring and summer of 1944, the Eighth was involved in the direct and indirect support of the invasion. The air arm was important in making the invasion a success, but again was diverted from strategic operations. While some key German industries had been attacked prior to the summer of 1944, the full scale attack of Germany did not begin until late summer. By then the Eighth had

overwhelming numerical and tactical superiority. The Luftwaffe made strenuous efforts to reverse the tide, but new equipment and new tactics were employed in too small quantities, too late in the conflict to have any impact. Meanwhile the strategic bombing attacks by the Eighth, Fifteenth, and Bomber Command effectively throttled both German industry and the German war machine. The attacks on oil and transportation were especially telling. One measure of the extent of Anglo-American air superiority is that by March 1945, the Eighth was unloading 263 tons of bombs for every heavy bomber lost, over ten times the figure of October 1943. It is important to point out that over 70 percent of the bombs fell on Germany after 1 July 1944, that is, in the last ten months of the war.² By late April 1945, the strategic bombers of the western Allies had run out of targets. In early May, what remained of the German war machine, surrendered.

Statistical Summary

While a chronological summary can give an overview of the strategic bombing campaign, it fails to indicate the intensity of it. Statistics may be boring by their very nature, but they can forcefully show the magnitude of the endeavor. A statistical summary is then another way, another cut if you will, at the same strategic air war over Europe.

The air war in World War II was first of all very costly - in men, money, and machines. Between 1942 and 1945, the AAF consisted of between 23 and 31 percent of the Army's men. In monetary terms, the air war in Europe cost the U.S. 43 billion dollars, or 24.5 percent of the American munition's budget. The entire American aircraft program alone cost 45 billion dollars.³

The result was an overwhelming Allied superiority in numbers of aircraft. The U.S. turned out almost 300,000 machines between 1940 and August 1945. The AAF did not get all of the 300,000, but did get 158,880 or 53.7 percent of those delivered. Of the 200,433

American built combat aircraft, the AAF received 99,487 or 49.6 percent. This exceeds the 86,491 combat aircraft manufactured by the Germans and approaches the overall German production figure of 114,000. In addition, America's two Allies each outproduced Germany: the British built 124,000 aircraft and the Russians built 137,000. So, even considering Anglo-American commitments in other theaters, the Allies had an aerial superiority in Europe on the order of three to one.⁴

America's principal theater was Europe. In all, the AAF deployed the most men overseas in April 1945, 1,224,000 in number. Of these, 453,000 were assigned to the ETO and another 157,000 were assigned to the MTO, together amounting to just about half of the AAF's total overseas deployment. At its peak in July 1944, the Eighth consisted of 199,641 men. In units, the Eighth had a maximum of 15 fighter groups (from May 1944 to the end of the war) and 40 1/2 heavy bomber groups (between June and October 1944). In terms of maximum aircraft, the Eighth had 2,018 heavy bombers effective for combat in April 1945 and 1,131 fighters in November 1944. In short, the Eighth was the largest air force the AAF fielded in World War II.⁵

The scope of the air war over Europe is also revealed in the casualty figures. The AAF lost a total of 22,948 aircraft in combat during the war. Of these 11,687 (50.9%) were lost in the ETO, of which the Eighth lost about three-quarters, 9,057 aircraft missing in action, missing, and classed "E". The bulk of the Eighth's losses were bombers lost on day missions: 4,299 heavies lost and 1,556 written off as category "E". The Eighth's loss in fighters was 2,217 aircraft lost in action and 778 classed as "E". Put another way, this was an overall loss rate of 1.99 percent of bomber credit sorties and 1.23 percent of fighter credit sorties in the war.⁶

In personnel, the AAF listed 40,061 dead, 18,238 wounded, and 63,568 missing or captured. Most of these casualties were sustained in the ETO, according to AAF figures, 19,876 dead, 8,413 wounded, and 35,121 missing or captured. The most current set of statistics on losses, (1953) lists 13,088 airmen killed in the ETO, 1,449 missing in action, and 14,750 captured or interned. The Eighth Air Force wartime tabulation has 3,030 killed, 1,984 seriously wounded, and 41,442 missing in action. I have found no way

to reconcile the three sets of numbers which show a total killed and missing in the ETO of 54,997 (AAF), 48,807 (Eighth plus Ninth Air Force) and 29,287 (1953 Army). If the Eighth and Ninth Air Force statistics are compatible, then about 83 percent of the dead and 85 percent of the missing in the ETO were from the Eighth. The only further breakdown of the Eighth's losses is from the Third Air Division. That unit, which consisted of about a third of the Eighth's men and machines, and possibly a third of the losses, sustained 2,496 dead, 4,935 missing, 4,927 captured, and 217 interned.⁷

In terms of sorties, the ETO accounted for 43.8 percent of the AAF's 2,362,800 combat sorties. The Eighth's bombers flew 330,866 total sorties, of which 293,919 were credit sorties, and 266,872 were effective sorties. The Eighth's fighters logged 265,457 total sorties, 243,811 credit sorties, and 238,634 effective sorties. About 81 percent of the Eighth's fighter sorties were flown as escort.⁸

During World War II the AAF dropped 2,057,244 tons of bombs, 47 percent in the ETO. The Eighth's bombers and fighters unloaded 696,451 tons. About 47 percent of the bombs the Eighth dropped were 500-pound high explosives, 14 percent were 1,000-pound high explosives, and about 13 percent were various size incendiary bombs. The American (ETO and MTO) and British air forces battling Germany dropped 2,770,540 tons of bombs during the war, 51.1 percent on Germany. Three-quarters of the 691,470 tons of bombs dropped by the Eighth's heavy bombers fell on Germany. Of the remainder, 21.2 percent fell on France. The target system that received the most attention from the Eighth was transportation, 34 percent of the total tonnage. Military and tactical targets were hit by 12.9 percent of the bombs, while naval targets (U-boat and E-boat bases and factories, docks and ports) were hit by 5.9 percent. Aircraft factories were hit by 6.9 percent of the total, GAF airfields by 12.4 percent, and miscellaneous targets, mainly targets of opportunity, received 3.8 percent of the Eighth's bombs. Oil targets were hit by 10.7 percent of the bombs while other industrial plants received 13.4 percent of the total.⁹

During the course of the war, the AAF claimed the destruction of 40,259 enemy aircraft in the air and on the ground. Almost 51 percent of these were registered in the ETO. The Eighth claimed a total of 11,481 aerial victories, 6,259 by the bombers, and 5,222 by the fighters. Almost 81 percent of the Eighth's bomber and 86 percent of the fighter claims were either FW 190s or Me 109s. The bombers logged more Focke Wulfs destroyed than Messerschmitts destroyed (49.6%:31.2%), while the Eighth's fighters scored in just the reverse proportion, 37.3 percent FW 190s and 48.6 percent Me 109s. In all, the Eighth claimed the destruction of 5,055 FW 190s and ~~4,490~~ 5 Me 109s in the air. In addition, the Eighth's fighters claimed 4,250 aircraft destroyed on the ground. To log these claims, the Eighth's bombers expended 72.3 million rounds of .50-caliber ammunition while the fighters used up 26.6 million rounds of .50s on combat missions. If the claims are anywhere close to accurate, it took over 11,000 rounds of .50s fired by the bombers and over 5,000 rounds fired by the fighters for each aerial credit. The Eighth used about 21 percent of the AAF's total ammunition consumption, while running up 39 percent of the AAF's total aircraft victories, and 41 percent of the AAF's aerial victories.¹⁰

Analysis

Regardless of how it is told, the story of the Eighth is a success story. The unit was given a mission, and, against a resolute enemy and other obstacles, carried out that mission. In so doing, the Eighth adapted to the situation in terms of equipment and tactics: simply, it met the challenge of combat and won. Five sets of factors affected the Eighth's part in the air war over Europe: weapons (aircraft, new equipment, and modifications), organization (tactics and techniques), men (crew and leaders), decisions above the Eighth, and non-military factors (geography and weather).

American aircraft were well suited for the ^{war.} Their design enabled American industry to produce them in great numbers, free of major faults, and adequate

for both the level of crew skill and combat. Although the different aircraft had various virtues and vices, advocates and detractors, they served as hedges against failures of each other. All were versatile enough to perform beyond the original intentions of their designers and their initial capabilities,^{as} constant modifications fitted them for battle conditions. The addition of Tokyo tanks, center nose guns, and chin turrets increased bomber performance in the same way that drop tanks, higher octane fuel, and bubble canopies aided the fighters. American day heavy bombers were in a class by themselves, while American fighters more than held their own against the Luftwaffe. New gunsights and ammunition also helped the gunners, as electronic devices improved navigation, bombing, and protection. Armor and flak curtains were added to protect the aircraft, while flak, electrically heated, and "G" suits were developed for their personnel.

The Eighth was aided not only by technology but by organization and training. Elaborate procedures were devised to allow vast armadas of aircraft to take off, assemble, find their targets, bomb them, and return home and land. Other aids for the heavy bombers included the use of weather and air scouts. Crew inexperience was a major problem, a problem aggravated by rotation policies and casualty rates. But rotation, along with other measures taken to provide for crew comfort in England, was necessary to uphold aircrew morale ^{IN FACE OF} high attrition. ^{THE ROTATION POLICY & HIGH LOSSES,} In combination with the crews' limited experience, continuous operations, and the difficult conditions met in battle over Europe, ^{INCREASED} the problems of navigation, bombing, and gunnery, and rendered a number of missions ineffective. To meet the experience problem, group bombing evolved into the use of lead crews. These specially selected, trained, and qualified airmen raised the level of the Eighth's performance and helped ameliorate the problems of crew inexperience. New formations and new organizations evolved to handle the large numbers of aircraft. Deceptive routing, feints, multiple approaches and shuttle bombing were other tactics used to facilitate bombing. With the decline of the GAF fighter arm, emphasis shifted from the defense against fighters, toward defense against flak. Throughout constant efforts were made to increase bombing

accuracy. Fighter tactics were modified, especially with the steady extension of range and the loosening of the escort in early 1944. Strafing developed into a major fighter tactic and was used effectively, although at a considerable cost. A major factor in developing these techniques were ^{REPORTS FROM} civilian experts in the Operations Research Sections.

The Eighth's aircrews showed skill, discipline, and courage, especially the latter. At the same time, the ground crews supported the operation and conquered ground and repair difficulties of an unparalleled magnitude. ^{AND} It must be remembered these men were recent civilians thrust into the most demanding combat theater of the air war. The Eighth's leaders were very important in bringing about the Eighth's victory. They took untried doctrine, equipment, and men into the most critical air battle in the war and beat the enemy. The bombers were frequently led by their division, wing, and group commanders. General Kepner, for example, flew 14 bomber and 10 fighter missions, and General Travis flew at least 17 bomber missions. The Eighth lost two Brigadier Generals in combat. Just as important as the personal leadership, ~~WERE~~ ^{WERE} the day-to-day decisions of the Eighth's leaders that frequently risked the unit to the GAF and the weather. ¹¹

The last two categories of factors that affected the Eighth, decisions above the unit and non-military factors, need to be mentioned but only briefly. Military decisions in Washington determined the Eighth's targets, resources, and mission. Likewise, non-military aspects such as geography and weather, were outside the airmen's control, yet had to be worked around. The Eighth did just that and accomplished its mission at a low cost in American lives.

One way to highlight the Eighth's successes is to compare and contrast it with the GAF's failures. For whatever were the Eighth's problems, they were minuscule in comparison with those of the Germans. Moreover, whatever were the Eighth's responses to the Luftwaffe, the response of the GAF is even more open to criticism. German equipment was good and there was relatively little difference between the opponents' weapons. Although the German war industries supplied adequate, and in some cases superior weapons (jet and rocket aircraft, for example), they were never enough to overcome either Allied

numbers or pilot quality. In the west, the GAF was unable to successfully meet all three strategic aerial threats, American day bombers, British night bombers, and American escort fighters. German production failed because of high level decisions and Anglo-American bombing. Luftwaffe equipment in the field and on the drawing boards could not solve Germany's aerial problems or seriously dispute Allied air superiority, much less regain it. What counted in the end and what decided the battle for the air was the training, numbers, and weapons of the men actually in combat. For "it is just as essential not to use the unready weapons of the next war as it is not to use the outclassed weapons of the last."^{11a} The Germans fell into this trap, the western Allies did not.

Luftwaffe tactics were even less satisfactory when compared with the Eighth's. The insistence on particular tactics (tail attacks, for example) and tactical rigidity hamstrung the GAF. Twin-engine fighters armed with large caliber cannon and rockets, was the solution to unescorted bombers, but proved ^a costly failure when faced with escort fighters. Air-to-air bombing, rockets, and ramming were inadequate solutions. While some criticize the GAF's failure to meet the Eighth Air Force at the coast, the failure to exploit intruder tactics is a much more clear cut mistake.

GAF leadership at the upper levels was weak. Hap Arnold believed that German blunders materially contributed to the Allied victory. Or, as Bomber Harris so well put it:

The Germans never made a small mistake, because they are cautioned against all small mistakes in their manuals, without reference to which they seldom do anything whatever. But they can always be relied upon to make all the imaginable large and catastrophic mistakes, together with a good many that only a German could think out.

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Considering some of the disasterous German decisions, this description is apt. The failure to build up the Luftwaffe sooner and to capitalize on the jets were both large blunders. But undoubtedly the decisive mistake dealt with the pilot training program.

The failure to expand the program early in the war, the later decision to cut flying hours, ^{ALONG WITH} attrition, left the GAF with a numerically and qualitatively inferior pilot corps. For it was superior Allied numbers, but most of all, superior Allied fighter pilot quality, that defeated the Luftwaffe.

German political decisions were even worse. The greatest mistake was, of course, to get involved in a war on three land fronts, western Europe, Italy, and Russia, against America, Britain, and Russia at the same time. Failure to quickly and fully mobilize the German economy was another colossal mistake. Both Hitler and Goering interfered with the GAF, much to its detriment. In short, the Luftwaffe played a weak hand, poorly.

Relative to the Eighth, the GAF had less resources, greater commitments, made more and worse errors, and made inadequate tactical adjustments to the tactical situation; it was beaten by superior quantity and quality. The Luftwaffe was strapped by a three-front air war and was unable to meet the three aerial threats in the west. A comparison of the Eighth's and the GAF's tactical development indicates that although the opponents' weapons were relatively equal, the Eighth's tactics worked, the German's did not. The decisive tactical difference was the Eighth's decidedly superior leadership and crew quality. In addition the Eighth had both better support and high level direction. Unlike the GAF, the Eighth made the necessary modifications of equipment, doctrine, organization, tactics, and training that were required. These changes, the tactical evolution, were the elements of victory. This tactical development was as remarkable as the Eighth's major contributions to the war effort.

Results

The impact of the air war against Germany was massive and many faceted. The often quoted conclusion of the United States Strategic Bombing Survey remains the most authoritative summary of that effect:

Allied air power was decisive in the war in western Europe.

Hindsight inevitably suggests that it might have been employed differently or better in some respects. Nevertheless, it was decisive. In the air, its victory was complete; at sea, its contribution, combined with naval power, brought an end to the enemy's greatest naval threat--the U-boat; on land, it helped turn the tide overwhelmingly in favor of Allied ground forces. Its power and superiority made possible the success of the invasion. It brought the economy which sustained the enemy's armed forces to virtual collapse, although the full effects of this collapse had not reached the enemy's front lines when they were overrun by Allied forces. It brought home to the German people the full impact of modern war with all its horror and suffering. Its imprint on the German nation will be lasting. 13

Before discussing the specific results of the bombing campaign it must be made clear that the air war was waged by American, British, and Soviet airmen against Germany on three geographic fronts. The AAF was engaged against Germany in two of these fronts, what were designated the ETO and MTO. Within the ETO the two principal strategic bombing forces were the ^{AAF's} Eighth Air Force and RAF's Bomber Command. The other major American air force in the ETO besides the Eighth was the Ninth Air Force, the American tactical air force, _{NO IP}

All of these air forces contributed to the defeat of Germany, and it is difficult and often times impossible to sort out exactly which result was caused by which air force. The first caveat therefore, is that no one air force did all the damage, and no one air force was exclusively responsible for any specific result.

The most important consequence of the air war against Germany was the defeat of the German Air Force. While there may be some controversy concerning other aspects of the air war, no objective observer can doubt that the Luftwaffe was clearly defeated by the Allied airmen. The important of this defeat is that it permitted the air war and the ground

war to be fought to the advantage of the Allies, a huge advantage indeed. It must be recalled that the GAF and the tank were the two major elements comprising the Blitzkrieg which gained Germany its early, astonishing, and spectacular successes. Because of the GAF's power and the potential of air power, the primary mission assigned to the Anglo-American air forces was to gain air superiority in time for the cross channel invasion. This feat was accomplished chiefly by the Eighth Air Force. The consequences of Allied air superiority were many fold. First, Anglo-American soldiers in Europe seldom saw German aircraft and were even less likely to have been attacked by them. Unlike the situation in 1940, in 1944 and 1945 the western Allied armies were fighting under friendly skies. The possession of air superiority also allowed the strategic air war to be fought to the advantage of both the day and night bombers.¹⁴

The second major impact of the air war also had direct military consequences for the Anglo-American ground soldiers. Air attacks on German transportation and oil severely restricted the mobility of the German army. The destruction of rail and road bridges, the demolition of communication centers, and the attack on German reinforcements hampered the German response to the ground armies of the Allies. One reason the Blitzkrieg had been so successful was that the German army moved faster than its opponents. In 1944 and 1945, the opposite was the case. While strategic bombers cut oil and rail supplies, the tactical aircraft made a more direct contribution to the progress of the land forces. Allied aircraft, mostly tactical aircraft, hit the German forces constantly bringing overwhelming firepower to bear, easing the way for the ground forces. The key weapon in this regard was the versatile fighter bomber.

The third major contribution of the air offensive was to divert German resources from offensive operations to defensive operations. Defensive fighters were built, not offensive bombers. The strategic bombing offensive tied down vast amounts of German resources. Possibly one million people were involved in flak defense, while another one to two million were engaged in repair activities. In addition, large percentages of resources were required by the Germans to defend their homeland. Albert Speer, the brilliant German industrial organizer estimated that in 1944 30 percent of German artillery production, 20 percent of

heavy caliber ammunition, 50 to 55 percent of electronics, and 33 percent of optics were used in air defense. Had the strategic air war not been waged, most of these resources would have been available for use against Allied ground forces.¹⁵

The fourth major result of the air war was its adverse effect on the German economy. Bombing did have a considerable impact on the German economy, although this impact was not decisive. Albert Speer states that the bombing in 1944 cost the Germans 30 to 40 percent of their production.¹⁶ The Eighth's precision bombing, especially of oil, played a major role in smothering German production. And the equipment that the Germans were able to produce was not of the best quality, for the Germans emphasized quantity over quality. Short engine life, bursting gun barrels, and outdated equipment went along with expanded volume production. Most important, considerable amounts of this production never reached the troops. Some was destroyed by the bomber enroute to the front, while some could not be used because of transportation and fuel problems. What counts, in the end is how much and how good is the materiel that gets into the hands of the troops. In this sense then, the strategic bombing of Germany had a profound overall impact on the war.

Criticisms

But the strategic bombing offensive was not conducted without errors. Criticism of the bombing has been particularly sharp, and while some of the criticisms are well founded, others are emotional nonsense, sometimes revealing more about the writer and the times than about the bombing. American use of firepower, especially air power in Korea and most of all in Vietnam, has fueled the criticisms of the World War II bombing. How substantial are these criticisms? What criticisms can be made of the World War II bombing of Germany? That is, what does a hard look at the strategic bombing offensive against Germany 30 years later reveal?

First, the bombing did not win the war. Despite the claims of some of the aviation proponents before, during, and since the war, air power did not single-handedly defeat the Germans. Douhet's prophecies did not come to pass in World War II. Bombing in World War II proved that the effects of conventional bombs on physical and psychological targets were overestimated in the prewar years. While both targets were damaged by the strategic bombing, neither collapsed before the Allied ground forces defeated the German army in the field. Victory in Europe was gained not by strategic bombing alone, but by the combined efforts of the three major Allies; Britain, America, and Russia, AND by combined arms; air, land, and sea. Regardless of what some aviators would like to have done, the air offensive was never intended to defeat Germany. In that sense, because of the assigned goals, the ^{allotted} resources, and the targets chosen, strategic air power was never tested against Germany in World War II. It is pointless to speculate what might have happened. The leaders who decided against strategic bombing as the primary weapon against Germany, undoubtedly had at least two good reasons in mind. First, air power was untried, to stake all on its success would be a great gamble while there were traditional means available. Second, if air power was successful, the political effects of Germany surrendering without an Anglo-American presence on the continent was unthinkable. Their decision was a safe and sure one, and won.

A second criticism is lack of effectiveness of the bombing. The critics point to the fact that the German war production peaked in the summer of 1944, despite the strategic bombing. This assertion requires study and analysis as the facts are correct, but not the implication. It must be emphasized that the Americans and British misread the German economy and did not realize that the Germans had not fully mobilized until late in the war. Therefore the German economy was not stretched early in the war as the Anglo-American airmen ^{believed.} So the first result of the strategic bombing was to take up this slack in the economy. A second factor that helps explain the amazing German war production is the targets the bombers actually hit. About one-quarter (25.2%) was dumped on industrial areas (cities) and almost one-third (31.6%) on land transportation targets. Military targets, V-weapons, naval and port targets were hit by a sixth (16.9%) of the total tonnage. Manufacturing targets,

excluding the bombing of cities, were hit by only one-sixth of the bombs (14.1%).¹⁷ The Eighth's record shows much more effort directed against the specific industrial targets, 31 percent of its total tonnage and 38.7 percent of the bombs it dropped on Germany.¹⁸ The point is that well over half of the total bombing effort of the western Allies directed against Europe, and specifically against Germany was aimed at targets other than industrial. Further, most of the bombs fell late in the war. Only 18.2 percent of the bombs dropped on Germany fell before January 1944, and only 41 percent were dropped prior to 1 October 1944. Half of the Eighth's total tonnage was dropped after 1 August 1944 and half of the Eighth's tonnage against Germany fell after 1 November 1944.¹⁸ What this means is that the strategic bombers were unable because of strategic and tactical reasons from throwing their full weight against Germany until relatively late in the war. Little wonder, then, that Germany munitions production peaked in the summer of 1944. Once the Anglo-American strategic bombers began full scale bombing of German targets, especially oil and transportation, the results were dramatic.

The third major criticism of the strategic bombing, is that the resources put into it could have been more profitably used elsewhere. The underlying assumption of this criticism is that the bombing achieved little and that an alternative employment of these resources could have achieved more. All the other claimants are mentioned: sea power, ground power, landing craft, and tactical (ground support) aviation.¹⁹ While it is impossible to effectively argue against a hypothetical, some counter arguments can be made. Despite the "Germany first" pledge, the western Allies never threw their full weight against Germany in World War II. The war was also fought against Japan and fought on a number of fronts. Although the European theater had priority over the other theaters, scarce resources were drained off to these other areas. Strategic aviation was not alone in building up slowly in World War II; the entire buildup by the Allies was slow. While the strategic bombing offensive did not fully open up until mid-1944, it will be recalled that the cross channel invasion was not launched until June 1944. It is unclear that building fewer bombers would have pushed forward the date of the invasion. The case can be made that less attention to strategic bombing, especially day bombing, would have made the invasion more difficult. As already

mentioned, the chief accomplishment of the air war was to win air superiority. How could air superiority have been won without the day bombers luring up the GAF fighters to be knocked down by the escort fighters? In my view, there was no other alternative, certainly not one that would have achieved quicker or cheaper results. For air superiority was won, not by sea power, not by ground power, landing craft, or tactical (ground support) aviation, but by the heavy bombers and long range escort fighters of the Eighth Air Force. And, air superiority was vital to successfully conducting the cross channel invasion, and essential to achieving victory, overall victory, as cheaply as possible.

A fourth criticism of the strategic bombing offensive is the great destruction it caused. This criticism is summed up by the great military historian B.H. Liddell Hart: "Air power is more destructive than decisive."²⁰ Between 300,000 and 600,000 German civilians were killed by Anglo-American bombs during the course of the war as well as 58,000 French civilians. Twenty percent of Germany's dwelling units, 3.6 million in all, were destroyed, rendering 7.5 million people homeless. Berlin was pounded by 49,400 tons of bombs by Bomber Command alone, which along with the Eighth's bombs destroyed about one-third of the city's 6,427 acres of builtup area. In the course of the 363 attacks on the German capital, about 50,000 Berliners were killed (compared to 60,000 British killed in the entire war by German bombs and missiles), and 39.2 percent of the original homes in the city were destroyed.²¹

Morality aside, that is an issue more suitable for philosophers and theologians, was all the death and destruction justified? (Is this question a proper one, either after such a conflict or more to the point, during such a conflict?) In any case, for most, the bombing of factories is one thing, the blind bombing of cities is something else. In the cool luxury of hindsight, it is easy to criticize the policy of Bomber Command and its commander, Arthur Harris, that it was better to bomb than not to bomb.²² It should be remembered, however, that between June 1940 and June 1944 the only offensive weapon the western Allies possessed was strategic air power. While the issue of ends justifying the means can surely be raised, there should be no mistake regarding the system the Allies were fighting in World War II. But the question of means also applies to the Eighth's use of blind bombing.

While radar bombing of cities during non-visual weather brought up the Luftwaffe and forced the German flyers to fight at a disadvantage, the question is: was the military gain worth the destruction wrought? But, even if the Eighth's decision in this case can be justified, what of the Eighth's continued use of blind bombing after the GAF was beaten? A shade less than half of the Eighth's bomb^{TONNAGE} (49.7%) was aimed by non-visual means.²³ This occurred despite the pre-war theory and despite the American criticism of the British night area bombing. In view of these statistics, it appears that the Eighth's leaders agreed with Bomber Harris, that it is better to bomb than not to bomb. Such an attitude fostered blind bombing and contributed to the massive death and destruction, while its contribution to winning the war is certainly open to question.

Related to this criticism is the lack of coordination of the bombing offensive. Essentially the American and British waged two separate wars against the German homeland, with only a nod toward cooperation. Tactical considerations encouraged this tendency, as did the minimal coordination between the Anglo-American strategic bombers and even between the two AAF strategic bomber strategic air forces, the Eighth and the Fifteenth. Thus, the strategic bombing, regardless of its intent, became more a sledgehammer than a scalpel.

Even more substantial criticisms can be made on the tactical level. Clearly, the prewar American bombing theory of high altitude, unescorted, tight formations of self-defending bombers was shot to pieces over Germany. Not until funeral pyres of men and machines dotted the European landscape in mid and late 1943 did the American airmen make the adjustments mandated by the introduction of radar and the modern fighter. The most costly of the errors was to insist on unescorted operations. The theorists were wrong in forecasting decisive air action without first gaining command of the air, for air superiority was the key to all air operations and most land and sea actions in World War II. How many victories were won against forces with air superiority? Until well into the war, it appeared to most airmen of all countries that an aircraft having both bomber range and fighter performance could not be built. Thus, the American airmen were faced with the options of either not conducting strategic operations or conducting them unescorted. The AAF opted for the latter, despite growing reservations about the bomber's ability to survive unescorted,

beginning even before the war, and suffered the consequences. Only the innovation of the drop tank and later long range fighters, especially the P-51, were able to redeem the situation in 1944. But it was a costly and very closely run operation.

If the "can do" spirit and technological state of the art partially ameliorates the criticism of the AAF leaders for the lack of escort fighters from the outset of the bombing campaign, the same can not be said of the neglect of bomber defense measures. Despite the B-17's nickname "Flying Fortress", the great press accounts of numerous machine guns, and the American bombing theory, the bombers were deficient in defensive armament. The Americans were woefully tardy in fitting power turrets to their bombers, something other countries did years before. Not only was the gunnery technology neglected, so was gunnery training. It was not until after the U.S. entered the war that gunnery schools were established. It would appear that the AAF believed its own press and was awed by the number of .50s its bombers carried, resulting in a tragic neglect of flexible gunnery. While the B-17 armed and manned as it was in the 1930s might have been adequate against the fighters of that decade, it proved inadequate against radar and modern fighters of the 1940s. Technological advances shifted the advantage away from the bomber and the offensive, toward the fighter and the defensive.

Another reason why the unescorted bombing theory floundered, was that the crews who fought the air war against Germany were much different than those that developed the theory over the U.S. Although American flight crews were eventually to have more training than their opponents, they still did not have sufficient training to fly the tight formations, bomb or shoot with the accuracy required to make the American theory of bombing work. The system of rotation, although necessary to maintain morale, was another factor that diluted crew experience.

Limited bombardier training and experience was one factor that was responsible for poor bombing accuracy. Certainly the bombardiers that actually dropped the bombs on Europe did not have the same training and experience as did those in the 1930 regular air arm. Conditions over wartime Europe were much different than those over peacetime Texas.

There was first and foremost the matter of enemy opposition. Hostile flak and fighters were at the very least, distracting. One study indicates that bombing accuracy under fire was only 10 to 20 percent of what it was without opposition.²⁴ Another difficulty was weather. The American bombing theory was predicated on seeing the target, something that the weather over Europe often did not permit for days and weeks. Bombing studies showed a direct and dramatic correlation between the amount of cloud cover and the resulting accuracy. These three factors, then, wartime crews, German opposition, and European weather were a major part of the reason why the U.S. bombing did not come close to the prewar estimates and that unfortunate phrase: "pickle barrel accuracy".

Another area in which the AAF must be taken to task is bomber modifications. Although the modifications in general were adequate, the modification programs did not pay sufficient attention to the safe return of the bombers. In the interests of production volume, short cuts were taken, some devices removed and other devices not fitted to the bombers that would have increased the aircrafts' chances of survival. Specifically, the AAF deleted emergency means of feathering disabled engines, provided inadequate means to extinguish fires, and only tested engine armor. Any of these measures would have decreased the vulnerability of the bombers and increased the number of American bomber crews that would have made it home. The gain in morale and reduced crew attrition would have been weighty arguments had the AAF carefully studied these issues.

One of the most criticized aspects of the Eighth's performance was that of targets. As already noted, the Eighth was constrained by both high level direction and by weather as to what targets could and could not be hit. Nevertheless, targetting can still be criticized. Good intelligence, always difficult to obtain, proved both especially difficult to get and important in industrial matters. The attack on the bearing industry was launched before the industry could be taken out. The target was indeed vulnerable and vital, but not as crucial as the Anglo-American airmen believed at the time. In the attacks on the aviation industry, the airframe plants were hit, not the more important aircraft engine factories. German production is mute testimony to the error of that judgement. At least three critical industries were not directly attacked. Postwar investigation shows that both

chemicals and electrical power were extremely vulnerable and their destruction would have had rapid and dire impact on the German war machine. A third industry, ethyl fluid, was small yet vital. It produced an ingredient^{necessary} to the production of high octane gasoline which high performance piston engines require. Yet, this industry was never bombed.²⁵ Oil and communications proved to be key targets and their attack did have widespread effects. But even in these attacks, the western Allies frequently selected the wrong aiming points.

Finally, the airmen did not reattack the targets as often as necessary. Damage was overestimated, as normally buildings were more heavily damaged than the machines they housed. The Germans proved to be both ingenious and tenacious in repairing bomb and fire damage. It was the constant attack and reattack, the cumulative effect of the bombing that had the long term debilitating effect on the Germany nation. This was an intelligence failure, and the part Ultra played in this failure has yet to be assessed.

Some may criticize the AAF for not employing the B-29 in the European theater. Certainly the aircraft's marked superiority over the B-17s and B-24s would have increased the Eighth's fighting power. But the Superfortress had development problems and did not get into combat until mid-1944. By then, the air war over Europe had been won. Certainly the decision to go ahead and fight the air war with the weapons on hand was correct, for after 1944, increased bomber efficiency was not a crucial item as it had been prior to that time. Furthermore, even had the B-29 been ready earlier, it could not have stood up to the German jets alone, as Mig-15s over Korea proved a few years later.

A final tactical criticism is the Eighth's policy of fighter strafing. In the fight for air superiority in early 1944, strafing was a costly but effective tactic. The policy of permitting victory credits for aircraft destroyed on the ground encouraged the Eighth's pilots and did result in the destruction of large numbers of GAF aircraft on and near their airfields and a deterioration of Luftwaffe morale. Later, strafing was an appropriate tactic against German jets. But after air superiority was achieved, and against targets other than German jets, the tactic resulted in heavy losses for little real gain. German flak was effective, and very effective against low-flying aircraft. The Eighth Air Force lost some of its best pilots in strafing attacks. It must again be emphasized that the

Luftwaffe had more aircraft than it could use; it was the loss of trained fighter pilots that defeated the GAF. For the most part, strafing did not hit the correct target, while it was very costly.

In summary, then, the overall assessment of the American strategic bombing offensive against Germany is a positive one. The Eighth Air Force adapted well to the combat situation. The impact of the bombing was important in winning overall ^{ALLIED} victory, and not only winning, but winning sooner and cheaper than otherwise might have been the case.

The limited wars America has fought since 1945 should not diminish the accomplishment of American arms in World War II. In that war, America had a clear goal, a noble aim: to defeat a cruel, threatening, barbarism. The Eighth Air Force had a definite mission and did its part by clearly accomplishing its mission. It was accomplished by the Eighth's airmen with skill and courage. It was a proud achievement. It was then, and in retrospect, still is.

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8th AF Memorial Museum Foundation, Inc.

Box 4738, Hollywood, FL 33023, Phone (305) 961-1410, Lt Col John H. Woolnough
15 October 1979

FOR IMMEDIATE RELEASE

BIBLIOGRAPHY PROJECT AUTHORIZED

The 8th Air Force Memorial Museum Foundation has commissioned Dr. Kenneth P. Werrell, Associate Professor of History, Radford University, Radford, VA 24142, for the production of a comprehensive bibliography of the U. S. 8th Air Force. The Air Force Historical Foundation will oversee the project and will publish the results. Dr. Robin Higham, Kansas State University, AFHF Director of Publications, will act as the Project Officer for this bibliography.

The 8th AF, the World's largest striking force ever committed to battle, has had a great deal written about it, during and after WWII. The 8th AF Bibliography Project is aimed at identifying and recording the major historic works related to the 8th AF. Plans call for publication within one year.

The bibliography, "A Guide to the History of the 8th Air Force," will be produced in two main parts. The first part will be a bibliographic essay weaving the bulk of the available materials together with both narrative and critical comments. The second part will provide a straight bibliographic listing of all known material on the 8th AF. The use of this format will provide access to all who are interested in the 8th AF, whether they be laymen, scholars or veterans. Dr Werrell plans to include references to all material on the 8th AF of a historic nature, including museums, exhibits, Escape and Evasion and POW activities, and, of course, all the written works (Unit Histories - past, present and those in production will be featured).

Dr. Werrell, a graduate of the Air Force Academy and Duke University, is active in research panels related to military history and has published many papers on the air war in World War Two, especially on the 8th Air Force.

Persons with knowledge of research and documentation on 8th AF history are asked to write Dr Werrell. He is most anxious to receive comments on the readability and historic value of the various published works. In addition, he would like to learn of museums and memorials that have an 8th AF relationship. He also desires information on the identity of present unit historians in the 8th AF (WWII).

The 8th AF Memorial Museum Foundation was founded by and is supported by the 5300 member 8th Air Force Historical Society.

Dear Ken:

I've thought of calling you several times, but don't seem to get that done, so I'll try writing a letter this morning.

I am still hard at work on the 306th history, about to open the 10th chapter, centering on the activities of June and July 1943. It is moving along well, and I enjoy the writing very much, although there are far too many interruptions to suit my taste. I still have a goal of completing the first draft this summer, and then re-writing until about the end of the year.

It is a great deal of fun to pull together so many diverse elements, and my research and other hard work is paying off at this point. I'm certainly glad that I had the insight at the very beginning to organize a card file of personnel. I know the list is not complete, but it must be now about 98%, and without it I would be in great difficulty.

I continue to see people, to phone them, and to correspond with them, and usually I am turning up additional critical data. I had a question of a man in Oregon recently, wrote him, and he phoned me on a Saturday morning and talked for 55 minutes. Helped me on several points.

I managed two visits to California last year, interviewing people on both, was in Dallas, and then in Florida two different times. Before I am finished I expect to make this circuit all again, and to pick up additional data.

How is your opus coming for the 8th? Came across some stuff this weekend in a book, "The American Soldier: Combat and Its Aftermath." This included some psychological studies on the 8th, and wondered if it is the kind of thing you are including?

Its about time for me also to get to work on another Echoes. The last got held up in the post office, so April came out in May. But now a July number is before me. But I already have quite a bit of it in type, so must just really put together all the little stuff and get it off to be set.

As you may wonder, the tornado missed both home and office, carving a path between, but it did decimate some relatives, and kept me busy for the rest of the week.

One of these days I'll give you a call.

20 October 1-80

Dr. Kenneth Werrell
1112 Grove Avenue
Radford, VA 24141

Dear Ken:

Our computer seems to have rejected your name, so you have not been on our mailing list. I'll try again. One man is up for a third try at getting him on.

As a result, I don't thi-nk you have seen recent issues of Echoes, so I am enclosing them. I think you'll find the most recent issue interesting. It may stir up some controversy, and the more I think through the matter, the more I am of a like opinion--Overacker was not replaced for his own errors, but it was a means of serving Eaker's needs, and he was the only group commander for whom an excuse could be found.

My manuscript is breezing along well, not that I have a firmly established schedule for writing, and I should be through the first d-raft in six weeks. Then I'll get to work on refining it and sending it along to my editor.

Have not yet worked on a publisher, but will do so during November through a contact within the Group.

What is the state of your book?

Sincerely yours,

2 January 1980

1112 Grove Avenue

Radford, Va. 24141

Dear Russ,

Glad to hear from you. I trust that the new year and new decade are treating you well. I expect that the move from N.C. to Mich. is a move up. Good for you!

I finally got my manuscript off to a reader and now am awaiting his comments. There certainly is a lot coming out on the air war, but most, as you know, is junk. I am now thinking about a publisher. Any thoughts?

I am looking forward to seeing your book. From what you have done with the 306th Echoes and the research you've done, it should really be a contribution. By the way, I'm including a number of articles from the 306th Echoes in the bibliography. By the way, any title for the 306th history you're writing?

Well, drop a line now and then, especially if you have some ideas on this bibliography.

Best regards,

Ken

17 November 1981

576 East Moye Drive

Montgomery, AL 36109

Dear Russ,

Well I'm finally getting this long overdue letter off to you. As you can see by the above address, I'm now down at Montgomery, working in the Air War College on the Cruise Missile. It looks like I'll be here a year or two.

I was very pleased to see that your project was approved. It has all the possibilities in the world, and knowing how you work, I'm positive it will be a winner. I look forward to seeing it, but if Higham and Aerospace Historian are doing it (as they did the 8AF Bibliography) I will have to buy it. I intended to send you a copy of the bibliography but I received only one (yes ONE) author's copy. I'm sorry about that.

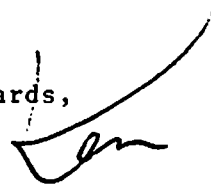
I've just seen Freeman's new book Mighty Eighth War Diary. As I'm sure you're aware he's done a real good job, including a picture of you! Well the books keep coming out on the Eighth. I've sent my manuscript on the 8AF off to the Office of Air Force History. I sometimes wonder if it will ever see the light of day.

Well not much else to report. I'm doing a little work in the Simpson Archives, looking into the B-29s in the Pacific, aerial mining, and the 15AF. This cruise missile has me pretty well tied up, so I'm not sure what I'll be able to do. I guess we'll just have to wait and see.

Please update my address for the 306th Notes. I believe the last copy I received was vol. VI, no.2. Can that be right? Speaking of the 306th, I'd like to get your comments on what Freeman says in MEWD on the relief of the unit's CO when Armstrong took over.

Take care and keep up the good work.

Best regards,

A handwritten signature in black ink, appearing to be 'Lan', written over a long horizontal line that extends to the right.

30 November 1981

Dear Ken:

I have made note of the new address, and it will be duly corrected. And I am enclosing the copies of Echoes you may have missed.

The book is now in galleys, and they have been read and returned to the printer for correction. Because of my background in publication work I will do the paging, which should help in getting it straight. Right now they are still talking late January for printing and binding.

I am using Hunter Publishing out of Winston-Salem, and went to see them last Wednesday as I was in the state for Thanksgiving with my sons. Things are moving well, and I have only a few little pieces to finish up at this time.

I gather you have left the academic ranks.

Rand, McNally was interested in my book (the production VP was a co-pilot cum POW) and was very interested. They were most complimentary but decided they did not have the right marketing mix to handle it.

Rather than fiddle around I decided to go for it myself, and thus am in it financially up to my eyeballs. I think I'll come out o.k., and probably make a fairbit of money--if you don't count time, etc.

I haven't yet seen Freeman's new book. When I do I'll drop you a line about it.

On the relief of the 306th CO, I have interviewed both he and Eaker on the subject, so I think I have a pretty good fix on it. I still think the reasons why he put Armstrong in might be interesting. I would guess that Eaker regarded him as a protege. Heywood Hansell told me that he hated Armstrong and did not trust him one iota when Armstrong was his assistant C.O. in First Wing.

Had a letter from Higham asking who was going to do my book, and I was delighted to write him and tell him that I was. I think it will have a much better appearance that way. It will be 6x9 with 24 pages

Werrell = 2

of pictures and a couple of appendixes. Had I let him take it I would have lost all control and probably wouldn't have made any money to boot.

I did buy one of your bibliographies from him, took it apart and put it in a hard cover binding. (That is one of my hobbies when I can find time to work at it.)

If you ever come across any good stuff in the Simpson Archives and want to send it along to Echoes, please do so. I'd like to put in some coverage before too many issues on the Casey Jones project. I have a lot of plane pix from that era, but precious little information.

Nice to hear from you,

20 February 1985

Dr. Kenneth Werrell
Professor of History
Radford College
Radford, VA 24141

Dear Ken:

I have seen some of the correspondence that transpired between you and Denny Scanlon concerning a revision of the 8th AF Bibliography. There certainly has been a bit printed since that came out, and I'm glad to see that it will be updated.

Here is a copy of the project I worked on for three and one-half years. It, too, will be printed by Robin Higham's outfit.

Having access to a good xerox, etc., I made myself a few copies before I sent it off for actual publication.

The other day I realized that you would probably like to have one in your possession, so here it is.

My feeling is that it is the only book of this kind ever to dip so deeply into a military organization perhaps at any time in history. I don't know if it will ever be updated, but it might some time. I am trying to keep track of men, but probably am only skipping across the surface. In any length, it ought to be very useful to people doing 8th AF pieces.

This book was a lot of fun to work on but ate time with an improvident appetite. Now I have lots of free time, and have not really gotten on to another project. I am busier with 306th BG matters and Echoes than I have been in quite some time, but I hope to be off on another chase before too long. I have several ideas that I think are worth pursuing. Hope I can make some connections to enable me to do so.

Sincerely yours,

Russell A. Strong

26 Feb. 1985

Dear Russ,

Thank you very much for sending me a copy of your "Biographic Directory." It arrived yesterday, and I am most impressed. You've done a lot of work, and have produced an item that will be of great help to scholars and buffs alike.

I got a phone call from Denny Scanlon last Friday in which he told me that the 8th AF Foundation wants to put off the update for another year. I'm not sure exactly what the problem is, but I certainly have enough other things to do. Right now I'm about to return to my 8AF manuscript that I've been picking at for too many years.

I have many more ideas for projects than I have time.

I wish you well in your efforts. More work on the 8AF is merited, and you certainly have done much. I look forward to hearing of your future projects, and of course, making use of them.

Thanks again for the "Directory."

Best regards,

