

# Winged Defence:

Answering the critics of Airpower

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The use of airpower, and specifically strategic bombing, has frequently generated controversy. Even before the 'aeroplane' ever flew, debates have raged over its utility, effectiveness, efficiency, legality and even its morality. These debates continue despite (or perhaps because of) the hundreds of books that have been written on the subject and the scores of examples we have been able to witness. As the old saying goes, certain topics tend to produce more heat than they do light. In some cases, the questions regarding airpower, strategic bombing and their roles in war are unanswerable, or at least un-agreeable. Soldiers, sailors and airmen tend to approach war from different viewpoints and with differing service-cultural perspectives. Others who write and speak about war are similarly influenced by these varied perspectives. This is natural and perhaps advantageous—fresh ideas are always useful. Unfortunately, much of the debate regarding airpower and strategic bombing has been coloured by accusations, misconceptions, inaccuracies, myths and simple untruths.

Bohlen synthetic oil plant under attack

The concept for this essay occurred to me as a result of innumerable questions asked or statements made to me over the past decade by students at the US Naval War College and Air University. I have also lectured at several other Staff Colleges and War Colleges in the US and abroad and had similar experiences. Many scholars have similarly raised such issues, so I decided to explore them in more depth.

This paper does not purport to be a historical overview of strategic bombing or strategic thought. Rather, it is a series of points and counterpoints regarding airpower. It is an attempt to clear away some of the detritus obscuring the subject to allow more informed debate on the real issues concerning airpower and strategic bombing. This in turn, hopefully, will give our political and military leaders a better basis on which to form decisions in future conflicts.

**Charge:** The US Army Air Corps and Royal Air Force entered World War II with a 'Douhetian' concept of airwar that emphasised area bombing and the waging of war on women and children.

**Response:** Giulio Douhet was an Italian air theorist whose major work, *Command of the Air*, appeared in 1921 and predicted future wars that saw the use of gas bombs and high explosives against urban centres.<sup>1</sup> However, no one in the US Army Air Corps hierarchy during the 1930s advocated such an air strategy. On the contrary, for various military, legal and humanitarian reasons, such an air strategy was expressly rejected. Instead, the Air Corps Tactical School (ACTS) formulated a doctrine of high altitude, daylight,



Bombs falling on the Bremen oil refinery

## It called for the destruction of Germany's industrial structure through a sustained bombing campaign...

precision, formation bombing of industrial targets. Specific military targets such as transportation networks, oil, electricity, chemicals, and munitions factories were the key systems singled out for attack.<sup>2</sup> The prewar theories of ACTS were translated into a war plan in August 1941, AWPDP-1. Its thrust was strikingly similar to those theories—no surprise since four former ACTS instructors wrote the plan. It called for the destruction of Germany's industrial structure through a sustained bombing campaign.

The doctrine manual the AAF took into the war, Field Manual 1-5, 'Employment of Aviation of the Army,' listed several potential target systems that could be struck after the first priority (enemy forces) had been sufficiently tackled: raw materials, rail, water and motor communications, power plants, transmission lines and other utilities, factories and processing plants, steel mills, oil refineries, 'and other similar establishments.'<sup>3</sup> There is no mention in the manual of targeting population centres or popular will. The situation in Britain was similar. The official doctrine of the Royal Air Force was articulated in official doctrine manuals, CD-22 'Operations' (1922) and AP 1300 'War Manual.' This latter document was first published in 1928 and defined the 'vital centres' of an enemy nation as consisting of organised systems of production, supply, communications and transportation. It did not refer to bombing of the population. A revised version of AP 1300 appeared in February 1940 and repeated these targeting priorities; in fact, it went to some lengths to stress that the civilian populace was not a legitimate military target. This was not just for public consumption. During the Battle of France in June 1940 the Chief of Air Staff sent a message to all of his commanders emphasising that the intentional bombing of the civilian population was illegal. The types of targets to be struck were limited to enemy forces, fortifications, supply depots, shipyards, power stations, oil refineries, munitions factories and rail lines.<sup>4</sup>

On the other hand, the bleak realities of war, coupled with the technological limitations of contemporary aircraft and bombsights, the miserable weather over both Germany and Japan, and extremely stiff enemy defenses, rendered prewar doctrine insufficient. But few sailors or soldiers accurately predicted what the war would look like either, as the Battle of France and the Atlantic, Pearl Harbor, and Kasserine Pass painfully illustrated. It took all of the services time to adjust to the war's realities.

**Charge:** Airmen thought they could win the war alone.

**Response:** Airmen did not believe they could win the war 'alone'; rather, they thought that airpower could play a dominant or perhaps decisive role in both Western Europe and the Pacific—just as soldiers and sailors believed they could play such roles. Airmen fully realized the importance of the massive attritional toll that the Eastern Front was taking on the German war machine, as well as the serious effects the blockade and the US Navy's unrestricted submarine warfare campaign were having on Japan. What some airmen did maintain was that given a higher priority, strategic bombing—in conjunction with these land and sea campaigns—could bring about German and Japanese surrender prior to an Allied invasion of the Continent or of the Japanese home islands. That is in fact what happened in Japan, and it was believed that it could have happened in Europe. When one recalls that much of the Allied bombing effort was diverted to support the North African invasion, the Battle of the Atlantic, the invasions of Sicily and Italy, the attacks on the German V-1 and V-2 launching sites and the submarine pens, the Normandy invasion, the Okinawa campaign, and B-29 mine-laying operations in Japanese home waters, one can better understand the airmen's argument. Indeed, 72 percent of all Allied bombs fell on Germany after 1 July 1944.<sup>5</sup> In the Pacific, 96 percent of all bombs fell on Japan after March 9, 1945.<sup>6</sup> Airmen have often wondered what the results would have been had this 'crescendo of bombing' occurred a year or more earlier.

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Albert Speer, German Minister of Armaments and Munitions 1942-1945

...fighter production apparently did increase, but did so at the expense of bomber and cargo aircraft production...

**Charge:** German production continued to increase throughout 1944, especially aircraft production. Therefore, the Combined Bomber Offensive (CBO) was ineffective, and the resources going into it would have been better spent elsewhere.

**Response:** Production did increase in Germany up through the first half of 1944; it then began falling precipitously in virtually all categories starting in the autumn of 1944. Most of the production increase was the result of slack in the German economy—it had not been fully mobilised for war at the outset of hostilities—and tremendous inefficiency within that economy caused by the lack of centralised control over raw materials and production assets. (Studies after the war, for example, revealed that the automobile industry, the largest sector of the German economy in the 1930s, was utilised at barely 50 percent of its capacity during the war.)<sup>7</sup> Many of these maladies were remedied by the appointment of Albert Speer as Armaments Minister in early 1942. The real issue concerns what German leaders expected to produce in 1944, versus what they actually did produce. The difference between those figures is largely attributable to the effectiveness of the CBO. In January 1945, Speer reported that in 1944 Germany had produced 35 percent fewer tanks, 31 percent fewer aircraft, and 42 percent fewer trucks than planned.<sup>8</sup> German industry was able to surge in 1943 and early 1944 partly because it had not yet been seriously attacked; when it was, the results were dramatic. In January 1945 Speer wrote Hitler:

The war was over in the area of heavy industry and armaments . . . From now on the material preponderance of the enemy can no longer be compensated for by the bravery of our soldiers.<sup>9</sup>

As for aircraft production, fighter production apparently did increase, but did so at the expense of bomber and cargo aircraft production — 65 percent of all aircraft accepted by the Luftwaffe in 1944 were single-engine fighters.<sup>10</sup> In 1942 over half of aircraft production had been bombers, but by 1944 that number was down to 18 percent. The CBO forced Germany to stop building offensive weapons and concentrate instead on defensive ones in an unsuccessful effort to stop the Allied bombing campaign.

Even so, the supposed increase in fighter production is suspect. There were large discrepancies in the number of fighters allegedly produced, and the number actually employed by the Luftwaffe. In reality, despite all these production and acceptance statistics, the weakness of the Luftwaffe can be best understood when it is realised that by April 1944 there were only 300 German fighters in the west to oppose the 12,000 aircraft of the Allies, and there were another 500 in the east to oppose the 13,000 aircraft of the Soviets.<sup>11</sup> As a consequence, on D-Day the Luftwaffe flew only about 200 sorties — most of which failed to reach the beachhead and none of which inflicted significant damage — compared to the Allies who flew nearly 9,000.<sup>12</sup> Only six days after the landings, Prime Minister Winston Churchill and the Combined Chiefs of Staff thought the air situation safe enough that they actually visited the Normandy beachhead. The Luftwaffe had essentially been eliminated as a threat to the Allied invasion, despite what the production figures allegedly illustrated.

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Moreover, even if we sweep all those arguments aside, we look at the basic charge: that because production increased, the CBO was a failure. A different perspective would be to note that in 1939 the German Army consisted of 120 divisions. Yet, despite four years of war and the combined efforts of the Soviet, American, British and French armies, it had grown to 318 divisions by 1944.<sup>13</sup> Using the logic of the production argument above, that must mean the actions of the Allied armies were a dismal failure — no matter how hard they fought, the German Army continued to grow. Therefore, such (fatuous) logic would force us to conclude that the Allies would have been better off spending their money on something else besides ground forces.

**Charge:** Bombing was ineffective because it actually stiffened enemy morale rather than lowered it.

**Response:** Although this comment is heard frequently, there seems little basis for its accuracy. In truth, the USSBS reported the following regarding morale in Germany:

Bombing appreciably affected the German will to resist. Its main psychological effects were defeatism, fear, hopelessness, fatalism, and apathy. It did little to stiffen resistance through the arousing of aggressive emotions of hate and anger. War weariness, willingness to surrender, loss of hope in German victory, distrust of leaders, feelings of disunity, and demoralising fear were all more common among bombed than among un-bombed people.<sup>14</sup>

Regarding the Japanese population, the USSBS reported: 'Civilian morale was predominantly, but not completely, destroyed. Just before the end of the war there was still roughly one-fourth of the civilian population with some confidence in victory and willingness to go on.'<sup>15</sup> Although it is possible that initially there may have been a spike in morale among the enemy population — applying pressure to an object generally tends to consolidate that object before fracturing it — there is no evidence to support the claim of increasing morale under air attack.

As for the actual performance of German and Japanese workers, an important criterion is absenteeism. Whether a factory worker admits to bad morale or not, if he is not showing up for work because of the bombing campaign, then bombing is achieving one of its goals. In mid-1945, when the bombing campaign against Japan was at its height, absenteeism in Japanese factories was approaching 50 percent. Nearly 8.5 million people had fled the cities to escape the bombing campaign, nationwide, and of those 8.5 million, nearly  $\frac{1}{3}$  were factory workers.<sup>16</sup> That is not an indication of increasing morale. In Germany, absenteeism averaged 20 to 25 percent in many key factories.<sup>17</sup> Performance was thus suffering greatly in both Germany and Japan, as was morale. Three-quarters of the German people thought the war was lost by the beginning of 1944, and when asked by Gallup pollsters after the war what was the hardest thing

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they had to endure, 91 percent of Germans responded that it was the Allied bombing.<sup>18</sup> A classic study of morale under bombing that was conducted after the war confirmed the USSBS findings while also concluding that if the populace did become angry, it was usually directed at their leaders for failing to protect them, not against the enemy.<sup>19</sup>

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**Charge:** The atomic bombs were unnecessary. The Japanese were about to surrender anyway, and even if not, an invasion or continued blockade would have been more humane.

**Response:** There is no indication that anyone in authority within the Japanese government was seriously contemplating surrender in late July or early August 1945. President Truman's Potsdam Declaration, calling on Japan to surrender, or else, but also suggesting that survival of the emperor was acceptable, was rejected on 26 July. Top secret 'Ultra' message intercepts from the June and July timeframe revealed that the Japanese were expecting and indeed hoping for an invasion — they assumed it would be such a blood bath (based on casualty figures at Iwo Jima and Okinawa) that the Allies would be dissuaded from carrying through with an invasion, and they could therefore get better peace terms.<sup>20</sup>

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As for an invasion, according to Allied intelligence at the time, the Japanese defenders had increased to over 600,000 on the island of Kyushu — where our first landings, involving approximately 767,000 personnel, were scheduled to occur in November 1945. In reality, postwar findings revealed there were closer to 900,000 Japanese defenders.<sup>21</sup> An invasion of the main island of Honshu, consisting of over 1 million soldiers, sailors, airmen and marines, was already scheduled for March 1946. There were over 2 million Japanese regulars defending the main island.

The following statistics give an idea what an invasion would have meant:

Japanese soldiers tended to fight to the death rather than surrender — 95 percent on average throughout the war, with 97 percent at Saipan and 99 percent at Iwo Jima. Using the previous Pacific campaigns of World War II as examples, Japanese military losses due to US invasions would have been around 3 million dead.<sup>22</sup>

Based on the previous Pacific campaigns, US casualties tended to run about 1/5 of the number of troops engaged.<sup>23</sup> Thus, of the 1.75 million men scheduled to assault the Japanese home islands, we should have expected in excess of 500,000 casualties. During World War II about 30 percent of the US Army's combat casualties were deaths; based on that same ratio, the invasions would have cost around 150,000 US dead.<sup>24</sup>

Japanese civilians tended to get caught in the way when Allied and Japanese forces fought during World War II. As many as 150,000 Japanese civilians died during the Okinawa campaign, as well as 10,000 Koreans who had been brought in to perform heavy labour.<sup>25</sup> Hundreds of thousands of Japanese civilians would no doubt have been 'caught in the way' and killed in the massive ground assaults scheduled for late 1945 and early 1946.

As for cancelling the invasion and simply maintaining the blockade: this would have been an extremely long-term strategy, and it would have had two seriously deleterious effects. First, it would have slowly starved the Japanese population to death, as we did the Germans in World War I when it is estimated that well over 750,000 civilians died as a direct result of the Allied starvation blockade.<sup>26</sup> Deliberate starvation is not more humane than bombing. Second, while we held back and waited for the blockade to take effect, we would have been condemning the millions of Asians then under an oppressive Japanese occupation to death and privation. How many more Koreans, Vietnamese, Indonesians, Malays, Chinese, etc. would have died had we simply waited? As it was, as many as 6 million Asians died under Japanese rule.<sup>27</sup> An Allied policy of waiting would no doubt have been branded later as a deliberately racist strategy. In addition, more than 558,000 Allied prisoners of war and internees were still in captivity in August 1945. Japanese prison camps were notoriously deadly to their unfortunate inhabitants: nearly 40 percent died in captivity. Waiting the Japanese out almost certainly would have condemned these men and women to death.<sup>28</sup>

As for the contentious issue of what role the bombing, and specifically the atomic bombs, played in the Japanese decision to surrender, here are some statements made by key Japanese leaders at the time:

'Fundamentally, the thing that brought about the determination to make peace was the prolonged bombing of the B-29s.' — Prince Fumimaro Konoye, President of Great East Asia League and former Premier<sup>29</sup>

'Merely on the basis of the B-29s alone I was convinced that Japan should sue for peace.' — Baron Kantaro Suzuki, Premier<sup>30</sup>

'If I were to give you one factor as the one leading to your victory, I would give you the Air Force.' — Admiral Osami Nagano, Supreme Naval Advisor to the Emperor<sup>31</sup>

'The chance had come to end the war. It was not necessary to blame the military side, the manufacturing people, or anyone else—just the atomic bomb. It was a good excuse.' — Chief Cabinet Secretary Hisatsune Sakomizu.<sup>32</sup>

'The enemy has begun to employ a new and most cruel bomb, the power of which to do damage is, indeed, incalculable, taking the toll of many innocent lives. Should we continue to fight, it would not only result in an ultimate collapse and obliteration of the Japanese nation, but also would lead to the total extinction of human civilisation.' — Emperor Hirohito, radio address announcing surrender, 14 August 1945.<sup>33</sup>

**Charge:** Strategic bombing was, in balance, a wasted effort, and its overall effect was minor.

**Response:** The subject of strategic bombing's overall effectiveness in World War II and how decisive it was in victory could easily be the subject of several papers, indeed books. Unquestionably, it was the combined efforts of all the services and all the allies that brought victory. Even so, at the risk of oversimplifying the issue, here are some more statistics derived from USSBS and Overy:

By December 1944:

- German rail traffic was down 50%<sup>34</sup>
- Aviation fuel production was down 90%<sup>35</sup>
- Ruhr steel production was down 80%<sup>36</sup>
- German coal supplies were down 50%<sup>37</sup>

By mid-1943 Italian industrial production was down 60% (they soon surrendered, although Germany then occupied the country and continued to fight for another two years)<sup>38</sup>

75% of all German 88s (their best artillery piece and also best tank killer) were being used as anti-aircraft guns<sup>39</sup>



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Anti-aircraft artillery (AAA) absorbed 20% of all ammunition produced by Germany, as well 1/3 of all optics and more than 1/2 of all radar and signals equipment. The aluminium used to make AAA shells would have built an additional 40,000 airplanes.<sup>40</sup>

2 million people were engaged in the repair of damaged factories; 1/2 million more were engaged in trying to move German factories underground; 1 million were used to reproduce civilian goods destroyed by air attack; and 1 million were engaged in the production and manning of air defence equipment. (There were over 55,000 AAA batteries in 1943.) That's a total of 4.5 million people, or 20% of the German work force. What if those 4.5 million had been building tanks, or bombers, or submarines, or, worst of all, put in uniform and stationed in France to defend against an Allied invasion?<sup>41</sup>

I would also note that these production losses were not the result of key German industrial areas being overrun by Allied troops. Silesia was not captured by the Soviets until late January 1945; the Rhine was not crossed at Remagen until March 7, 1945; and the Ruhr, Germany's industrial heartland, was not overrun until April 1945. In the words of Colonel-General Alfred Jodl (Wehrmacht Operations Chief): 'So I would say that the decisive factor was not so much the very unpleasant effect of your air attacks at the front, as the destruction of the homeland, almost without resistance.'<sup>42</sup> Note also the following statistics from USSBS and Overy regarding Japan:

By July 1945 aluminum production was down to 9% of the wartime peak<sup>43</sup>

Steel and oil production were down to 15% of the wartime peak<sup>44</sup>

Production in cities not bombed in Japan was at 94% of the wartime peak, but 27% in cities that had been bombed<sup>45</sup>

Overall, Japanese production dropped 53% between November 1944 and July 1945, prompting the USSBS to state:

By July 1945 Japan's economic system had been shattered. Production of civilian goods was below the level of subsistence. Munitions output had been curtailed to less than half the wartime peak, a level that could not support sustained military operations against our opposing forces. The economic basis of Japan had been destroyed.<sup>46</sup>

Once again, this is not to say that airpower alone caused this catastrophic collapse. The US Navy's unrestricted submarine warfare campaign, as well as the amphibious assaults of hundreds of thousands of Allied troops were all crucial to ultimate victory.

Regarding the cost of airpower during the war: the US spent approximately \$183 billion on armaments during World War II, of which the AAF's aircraft share was \$45 billion (24.5%). Of that amount, the AAF spent \$9.2 billion on bombers (20.4% of the AAF total, 5% of the US total). The AAF bought 230,175 aircraft, of which 34,625 were heavy bombers (15%); as a percentage of aircraft weight, heavy bombers were 35% of the total.<sup>47</sup> In Britain, 50 percent of the defence budget during World War II went to the Army; 33 percent to the Navy, and 17 percent to the RAF—Bomber Command's share of the war effort was 7 percent.<sup>48</sup> Was the 5 percent spent on bombers by the AAF and the 7 percent by the RAF excessive?

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The Vietnam War is another subject that has engendered more emotion, more loose talk, and more misunderstanding than any conflict since World War II. Certainly, the great successes of airpower in the Persian Gulf War and the years since have muted much, but not all, of such talk. Indeed, it appears that in some quarters, precisely because of airpower's success since Desert Storm, many critics have looked backwards, hoping that by discrediting airpower in Vietnam, they will cast a shadow on the present. As a consequence, attacks on airpower's performance in Vietnam continue.

**Charge:** Airpower was a failure in Vietnam. It lost the war and let the Army down. Why do we even have an independent Air Force if it can't beat a fourth-rate power like North Vietnam?

**Response:** 8.7 million Americans served in uniform during the Vietnam War. Of those, 4.4 million were in the Army; 1.8 million in the Navy; 1.7 million in the USAF, and nearly 800,000 in the Marines. In addition, at any one time, there were nearly one million South Vietnamese ground troops on duty.<sup>49</sup> Thus, at the height of the war, there were well over one million Allied ground troops continuously operating in South Vietnam—a country the size of Wisconsin. Yet, all those ground troops were unable to control the countryside. If the Air Force, with its 1.7 million personnel failed in Vietnam, than the 9 million or so military personnel of the other services and the South Vietnamese failed even more completely.<sup>50</sup>

Moreover, it is important to note who was in charge of US political and military strategy during this war. There were seven positions of key leadership during the Vietnamese era, and these positions were occupied by 21 men from 1963 to 1973:

NAME	YEARS	BACKGROUND
<b>Presidents:</b>		
John F. Kennedy	1961-63	Naval officer in WWII
Lyndon B. Johnson	1963-69	Naval officer in WWII
Richard M. Nixon	1969-73	Naval officer in WWII
<b>National Security Advisors</b>		
McGeorge Bundy	1961-66	Army officer in WWII
Walt W. Rostow	1966-69	Army officer in WWII
Henry M. Kissinger	1969-73	Army NCO in WWII
<b>Secretaries of Defence</b>		
Robert S. McNamara	1961-68	AAF officer in WWII
Clark M. Clifford	1968-69	Naval officer in WWII
Melvin C. Laird	1969-73	Naval officer in WWII
<b>Chairmen, JCS</b>		
Maxwell D. Taylor	1962-64	Army officer
Earle G. Wheeler	1964-70	Army officer
Thomas H. Moorer	1970-74	Naval officer
<b>Theatre Commanders (CINCPAC)</b>		
Harry D. Felt	1958-64	Naval officer
U.S. Grant Sharp	1964-68	Naval officer
John S. McCain, Jr.	1968-72	Naval officer

#### Sub-Theatre Commanders

(COMUSMACV)		
Paul D. Harkins	1960-64	Army officer
William C. Westmoreland	1964-68	Army officer
Creighton W. Abrams	1968-72	Army officer

#### Ambassadors to South Vietnam

Henry Cabot Lodge	1960-64	Army officer in WWII
Maxwell D. Taylor	1964-65	Army officer
Ellsworth Bunker	1965-73	No Military Experience

Thus, of these 21 leaders, only one, Robert S. McNamara, had served in the Air Force (as a staff officer in the AAF). Ten others were or had been Army officers; nine others, including all three presidents, were or had been Naval officers; and one, Ambassador Ellsworth Bunker, had no military experience.<sup>51</sup> Moreover, during the 'Rolling Thunder' air campaign against North Vietnam from 1965 to 1968, the strategy, targets and even sometimes the tactics, were determined in Tuesday lunch meetings in the White House. No airman was ever invited to attend those meetings. General Earle G. Wheeler, an infantryman, attended instead and purportedly gave 'the air point of view.'<sup>52</sup>

Certainly, there is much blame to go around regarding how the Vietnam War was planned and fought, and airmen must share responsibility for defeat. But given that airpower was only one part of a fatally flawed strategy, and given further that airmen were permitted to play virtually no direct role in formulating that flawed strategy, one cannot place the main onus for defeat on airpower. It is also noteworthy that the most vocal military critic of our Vietnam War policy at the time was Air Force Chief of Staff General Curtis LeMay. For his pains he was forced into early retirement.<sup>53</sup>

**Charge:** Strategic bombing failed in Vietnam because 'Rolling Thunder' did not break the will of Ho Chi Minh and his cohorts to continue the war in the South.

**Response:** 'Rolling Thunder' was the air campaign against North Vietnam that lasted from 1965 to 1968.

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## Gradual escalation robs airpower of both its physical and its psychological impact...

It was not strategic bombing—it was an interdiction campaign, and a half-hearted one at that. Approximately 90 percent of all targets struck during ‘Rolling Thunder’ were transportation targets, and most of those were located south of the 20th parallel—well below the key industrial and transportation centres of Hanoi and Haiphong. The latter, North Vietnam’s major port through which it received 85 percent of all supplies, was not closed by mining until 1972. Supplies could not, therefore, be halted near their source. Indeed, both cities were usually off limits to bombing during ‘Rolling Thunder’ and prohibited zones were placed around them—up to thirty miles for Hanoi and ten miles for Haiphong. There were also sixteen bombing halts between 1965 and 1968. Finally, a prime principle of airwar concerns the necessity of achieving air superiority as a first priority. Without it, air operations become far more difficult. Yet, the Administration would not allow the North Vietnamese airfields to be struck until April 1967—more than two years after the start of the ‘Rolling Thunder’ campaign.<sup>54</sup> In addition, surface to air missile sites were often off limits to American air strikes—unless and until they took hostile action against our aircraft.

In 1964 the JCS proposed various plans that included air strikes against 94 key targets in North Vietnam that would be conducted over a period of sixteen days; the strike aircraft would include B-52s. In addition, the JCS—and note these were joint plans, not USAF plans—also proposed the blockade of North Vietnam and the mining of Haiphong harbour, as well as the introduction of US ground troops into South Vietnam to combat the insurgency. These plans were rejected by the administration.<sup>55</sup> Eventually, most of the 94 targets were hit, but over a period of three years, not the sixteen days called for by the JCS. It is a tenet of airpower doctrine that force should be used quickly and overwhelmingly to have the desired effect. Gradual escalation robs airpower of both its physical and its psychological impact. This tenet, however, was ignored. This does not mean that the JCS plans would have been successful if they had been approved and implemented. It is simply to say that the plans submitted by the country’s top military experts were rejected. Certainly, President Johnson had cogent political reasons for rejecting the advice of his top military advisors—his fear of Chinese intervention, for example. The result, nonetheless, was to make it extremely difficult to devise options that could navigate political shoals while also providing military success. The options that were implemented were failures.

The only time strategic bombing was attempted against North Vietnam was during the eleven-day ‘Linebacker II’ offensive of December 1972, when B-52s struck targets in and around Hanoi and Haiphong on a series of massive raids. ‘Linebacker II’ did not ‘win the war’ for the US and South Vietnam, but it did force the North Vietnamese government to return to the negotiating table and sign an agreement that had been agreed to ‘in principle’ but not signed two months before. At the same time, ‘Linebacker II’ reassured the South Vietnamese government—erroneously as it turned out—that we remained committed to its continued survival.

It has long been debated whether or not ‘Linebacker II’ actually coerced Vietnamese leaders into signing an agreement. Although the December settlement was similar to the one negotiated two months earlier, Hanoi’s leaders did not sign that accord. It is impossible to know if they would have done so without the Christmas bombing. It is interesting to note the words of two expert observers who expressed their opinions on the significance of those attacks:

‘One look at any Vietnamese officer’s face told the whole story. It telegraphed hopelessness, accommodation, remorse, fear. The shock was there; our enemy’s will was broken.’ — Vice Admiral James B. Stockdale, POW and Medal of Honour winner<sup>56</sup>

‘I am convinced that Linebacker II served as a catalyst for the negotiations which resulted in the cease fire. Air power, given its day in court after almost a decade of frustration, confirmed its effectiveness as an instrument of national power—in just nine and a half flying days.’ — Admiral Thomas H. Moorer, Chairman, Joint Chiefs of Staff, 1973<sup>57</sup>

**Charge:** Airpower was an indiscriminate weapon that killed excessive numbers of Vietnamese civilians.

**Response:** Guenter Lewy has provided the most authoritative statistics on casualties in the Vietnam War—although he himself admits these numbers should be considered estimates. He cites a figure of nearly 250,000 South Vietnamese civilians killed in the fighting, with another 39,000 assassinated by the Viet Cong. Trying to break down the casualties by cause is difficult, but based on those civilians who were admitted to hospitals between 1967 and 1970, Lewy estimates that 67 percent of all injuries resulted from mines, mortars, guns and grenades. The other 33 percent were injured by shelling or bombing. If these percentages are used for the entire war, and if we assume that the number of those injured by shelling or bombing are equal (Lewy doesn’t break this category down), and if we assume that those killed met their fates in the same percentages as did those who were wounded—and all of those are big ifs—then of the 587,000 Vietnamese civilians, both north and south, that Lewy states were killed during the war, then around 145,000 (25 percent) died from air attacks. The other 75 percent, over 440,000 people, were killed by ground or naval action.<sup>58</sup>

Also note that the Army declared certain areas in South Vietnam as ‘free fire zones’ where there was unrestricted use of artillery and mortar fire. While Air Force, Navy, Marine and South Vietnamese aircraft dropped five million tons of ordnance on South Vietnam, the Army and Marine Corps shot eight million tons of artillery rounds there.<sup>59</sup> A great deal of fire and steel was rained down on South Vietnam, but the majority of it was not dropped by aircraft.

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...of the 587,000 Vietnamese civilians, both north and south, that Lewy states were killed during the war, then around 145,000 (25 percent) died from air attacks. The other 75 percent, over 440,000 people, were killed by ground or naval action...

**Charge:** The USAF was insufficiently responsive to Army needs in South Vietnam.

**Response:** In truth, the USAF flew 3.9 million combat sorties in South Vietnam in support of the Army; of those, 633,180 were 'attack' sorties, including 67,477 B-52 strikes, each delivering up to thirty tons of bombs.<sup>60</sup> The Army commander in Saigon, General William Westmoreland from 1964-1968, determined the targets in South Vietnam for USAF aircraft—including the tens of thousands of B-52 'Arc Light' strikes, usually directed against 'suspected enemy locations.' The targets for strikes into North Vietnam came from Pacific Command headquarters in Hawaii (after they were approved in Washington). The USAF had no control over Navy, Army, Marine, or South Vietnamese aircraft and helicopters operating in South Vietnam.<sup>61</sup>

Despite successes in Desert Storm and thereafter, some unjustified criticisms of airpower continue.

**Charge:** Airpower was too focused on strategic attack during the Persian Gulf War, and support of ground forces was inadequate.

**Response:** Strategic attack made up only a small part of the Coalition air campaign. In fact, the Air Tasking Order that codes all air missions by type does not even have a 'strategic attack' category. Thus, missions that struck chemical weapons bunkers in northern Iraq or an electrical power plant in Baghdad were coded as 'air interdiction.'<sup>62</sup> Such a classification system seems incongruous if airmen really wished to emphasise strategic attack as their primary mission.

Even so, some targets were considered as being of a strategic nature: leadership (especially telecommunications), key production facilities (electricity and oil), transportation infrastructure (railroads and bridges), and NBC—Nuclear, Biological and Chemical research, production and storage facilities. Using these categories, of the 41,039 strike sorties flown by Coalition aircraft, only 5,692 (13.7 percent) would be classified as 'strategic.'<sup>63</sup> Moreover, because heavy bombers like the B-52 dropped a disproportionate share of the bomb tonnage during the war (32 percent), and most of those strikes were flown against the Iraqi Army, it is apparent that the vast amount of all bombs delivered fell on enemy ground forces and their equipment.<sup>64</sup>

...it is apparent that the vast amount of all bombs delivered fell on enemy ground forces and their equipment...

Consider also the weight of ordnance actually falling on Baghdad—the epitome of a strategic centre of gravity. In forty-three days a mere 330 weapons (244 laser-guided bombs and 86 Tomahawk cruise missiles) were delivered against Baghdad targets. Those 330 weapons represent 3 percent of all the precision weapons used during the war, which in turn amounted to less than 9 percent of all the air weapons expended. As a consequence, the total tonnage falling on Baghdad during the war was a scant 287 tons—a minute fraction of the total tonnage of 84,200 tons dropped by the Air Force.<sup>65</sup>

Damaged and abandoned Iraqi ground equipment, 1991



When it is realized that a military unit is considered 'combat ineffective' when it has lost 40 percent of its strength, it is small wonder that over 80,000 Iraqi soldiers deserted during the aerial pounding and another 86,000 surrendered virtually without a fight...

The effect of this massive air campaign against the Iraqi ground forces was enormous. US Central Command estimated that prior to the start of Coalition ground operations on 24 February 1991, all front-line Iraqi divisions had lost more than 50 percent of their strength; rear divisions had been reduced by 25 percent. More detailed examinations by US intelligence agencies after the war confirmed these percentages. When it is realised that a military unit is considered 'combat ineffective' when it has lost 40 percent of its strength, it is small wonder that over 80,000 Iraqi soldiers deserted during the aerial pounding and another 86,000 surrendered virtually without a fight.<sup>66</sup>

**Charge:** Air attack is nothing more than 'recreational bombing.' Pilots remain at such an altitude that they can't possibly hit their targets accurately.

**Response:** In operations such as Allied Force, the war over Serbia to free Kosovo in 1999, political leaders deemed it fundamental that NATO casualties be kept to an absolute minimum. The alliance was shaky from the start, but it would undoubtedly split apart if heavy casualties were sustained. Hence, early-on President Clinton and NATO leaders declared that a ground invasion was out of the question. Instead, airpower would be used as the weapon of first resort. Yet, the need to limit casualties, on both sides, remained a primary consideration for NATO leaders.

As a consequence, allied aircraft were directed to remain at medium altitude, usually above 15,000 feet, so as to remain above the range of most enemy ground fire. Some have argued that this policy induced inaccurate bombing, thus increasing collateral damage and civilian casualties.

In the vast majority of cases this was not true. A precision guided munition (PGM) is most accurate when it is dropped in the mid-altitude range—from 15,000 to 23,000 feet—allowing enough time for the weapon to



From the pilot's perspective, medium altitude is also advisable because it allows time to identify the target at sufficient distance, 'designate it' (if laser guided), and launch the weapon...

correct itself in flight. If dropped from a lower altitude, the weapon will have less kinetic energy, and its steering fins will have less opportunity to correct the aim; the weapon will usually land short of the target. From the pilot's perspective, medium altitude is also advisable because it allows time to identify the target at sufficient distance, 'designate it' (if laser guided), and launch the weapon. In short, for PGMs against a fixed target whose position is already established—which was the case in most of the targets struck in Serbia—the optimum altitude to ensure accuracy is at or above 15,000 feet.

To ensure accuracy, the optimum drop altitude for non-guided munitions is lower than for a PGM. Even so, acquisition remains a limiting factor: coming in too low at 500 knots makes it nearly impossible to acquire the target, line up, and place the bomb accurately. As a result, the compromise altitude for the delivery of unguided bombs is around 5,000 feet. However, this places the delivery aircraft right in the thick of fire from ground defenses. Allied Force commanders resolved this dilemma by keeping aircraft at medium altitudes, but restricting the use of non-PGMs to areas where there was little or no chance there would be civilian casualties or collateral damage.

A difficulty arises in identifying and attacking mobile targets. On April 14, 1999, near Korisa, Kosovo, NATO pilots attacked what intelligence sources had identified — and which indeed appeared to be—a military column. It is now known the column also contained refugees: several dozen civilians were killed in the air strikes. This is the only instance in the 78-day air campaign when NATO intelligence sources and aircraft at medium altitude combined to misidentify a target, thereby causing civilian casualties. Could this accident have been avoided if the aircraft had flown at a lower altitude? Probably. Indeed, NATO changed the rules after this, allowing aircraft in certain circumstances to fly lower to ensure target identification. There is, however, a tradeoff in such instances: if flying lower increases the risk to aircrews due to enemy ground fire, at what point does the risk of misidentifying a target override the risk of losing a plane and its crew? If friendly losses meant the shattering of the Alliance, were they preferable to allowing Milosevic to continue his atrocities unchecked?

**Charge:** Despite all the talk by airmen, airpower remains an indiscriminate use of military force that deliberately targets civilians.<sup>67</sup>

**Response:** Various books and articles continue to perpetuate this myth. Although one must recall the caution of Mark Twain regarding lies, damned lies, and statistics, the following statistics are fairly unambiguous.

Gil Elliot in *The Twentieth Century Book of the Dead* estimates that 110 million people is 'a reasonably conservative estimate' of the number who have died in wars during the first seven decades of the 20th century.<sup>68</sup> More than half of those died due to genocide and forced starvation. Of the 46 million who died due to 'technology,' Elliot lists the causes of death as small arms = 24 million; 'big guns' = 18 million; 'mixed' = 3 million; and aerial bombing = 1 million.<sup>69</sup> He notes that the figure of 1 million dead due to air attack may be higher, but certainly less than 2 million.<sup>70</sup> Thus, even if we add the numbers of those who have died since Elliot wrote in 1972, the number of those dying due to air attacks during the entire 20th century would not exceed 2 million.

Other researchers have listed a figure of 170 million dead in both internal and external wars during the 20th century.<sup>71</sup> Those who advance higher casualty figures usually attribute the additional deaths to even more vicious dictators than those assumed by Elliot. Bear in mind that more than 15 million Russian civilians died during World War II—and there was virtually no bombing taking place on the Eastern Front. Similarly, over 1 million civilians died in the siege of Leningrad where air attack played a negligible role.<sup>72</sup> One of the pervasive myths from World War II regards the death toll at Dresden resulting from Allied air attacks in February 1945. In truth, perhaps 30,000 died at Dresden, not 135,000 as initially claimed by David Irving—he later revised his figure down to 25,000 but everyone continues to cite his first number.<sup>73</sup> Even so, terrible as even that smaller death toll is, more than five times as many civilians were killed in the ground fighting on Okinawa a few months later.

If we are to accept these staggering figures, it means that of the 170 million people who died in wars during the 20th century, the overwhelming majority died as a result of military operations by armies, navies and paramilitary 'police' forces. Two million people, or 1.1 percent of the total, were the victims of air attack. Below are some more statistics relative to warfare since World War II:

According to Green Peace, 3,000 civilians died in the six-week Desert Storm air campaign; later studies lower that figure to 1,000.<sup>74</sup>

UNICEF reported in 1999 that the infant mortality rate in Iraq more than doubled in the decade following the imposition of UN sanctions. Worse, the mortality rate for babies (children under five) jumped from 56 deaths per 1,000 live births to 131. This means that between 1990 and 1998, over 225,000 Iraqi children have died as a direct result of 'bloodless' sanctions imposed by the United Nations.<sup>75</sup>

Slobodan Milosevic told US ambassador Richard Holbrooke that perhaps 25 Serbs died in the 1995 air campaign over Bosnia; NATO lost one aircraft, and the two crewmembers were captured and later released.<sup>76</sup>

Human Rights Watch states that around 500 civilians died in the 78-day NATO air campaign over Serbia/Kosovo; there were no allied casualties.<sup>77</sup>

18 US Army Rangers died in Mogadishu with another 80 or so wounded, but at least 500 Somali civilians were killed and another 500 wounded during the 24-hour firefight of October 1993.<sup>78</sup>

The American Red Cross states that 200 people worldwide are killed each week by landmines, with another 100 or so wounded. The US is not a signatory of the Landmine Ban Treaty.<sup>79</sup>

Certainly, it is most regrettable that any civilians are killed or injured by air attack, but we must be realistic. Innocent people always die in war—tens of millions of them over the past century. Given that less than 2 percent of them were victims of air attack, it is peculiar to charge that airpower is an indiscriminate or inhumane weapon. Unfortunately, there are those who still do. Yet, the arithmetic and facts are clear.

## Innocent people always die in war—tens of millions of them over the past century...

The biggest killers of the 20th century were small arms fire, blockades, sanctions, sieges, artillery fire, landmines, and, worst of all, despotic leaders who inflicted genocide and starvation on friend and foe alike. War is indeed hell and always has been, but there are ways to mitigate its effects on the innocent. Airpower advocates and theorists have maintained since the advent of flight that this invention offered a form of war that was less deadly, to both sides, than traditional means of war on land and sea. History has proven these prophets were correct. Moreover, the ability of aircraft to project force in a discriminate manner so as to minimise civilian casualties and collateral damage has continued to increase over the past two decades. It is not the answer to all problems and can still inflict most grievous harm. Yet, recent conflicts have made it clear that the centuries-old desire to wage war with humanity and discrimination is finally becoming possible.

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### Notes:

- 1 A revised version of *Command of the Air* was published in 1927. This version was translated into English by Dino Ferrari and published in 1942; it was reprinted by the Air Force History Office in 1983.
- 2 Thomas H. Greer, "The Development of Air Doctrine in the Army Air Arm, 1917-1941," USAF Historical Study, no. 89, 1955 (reprinted by the Air Force History Office, 1985), 57-60.
- 3 US Army, Field Manual 1-5, "Employment of Aviation of the Army," April 15, 1940, 36.
- 4 RAF "War Manual," AP 1300, July 1928 and February 1940, both chapter VIII; message from CAS to all AOCs, June 4, 1940, Public Records Office. For a more detailed discussion of this issue, see Phillip S. Meilinger, "Trenchard and 'Morale Bombing': The Evolution of Royal Air Force Doctrine before World War II," *Journal of Military History* 60(April 1996): 243-70.
- 5 United States Strategic Bombing Survey (USSBS), "Over-all Report (European War)," Sep 30, 1945, 10. The Strategic Bombing Survey was chartered by President Roosevelt in 1944 to examine the effects of strategic bombing on Germany and Japan. The Survey was headed by Franklin D'Olier, head of the Prudential Insurance Company who had no previous experience with aviation. D'Olier divided the roughly 1,500 members of the Survey into groups corresponding to target sets: oil, chemicals, transportation, etc. Each of these divisions was headed by a distinguished civilian businessman, economist, engineer or lawyer, including such later luminaries as Paul Nitze, George Ball, and John Kenneth Galbraith. Even included was Dr Rensis Likert, a specialist in public opinion sampling. After examining mountains of documents, interviewing thousands of German and Japanese leaders, and visiting scores of bombed sites, the Survey produced 212 volumes on the strategic air campaign against Germany and a further 108 reports on Japan. Although the Survey has had some detractors over the years, especially regarding internal squabbles between some of its members, no one has attempted to refute the findings of the Survey itself—its research and documentation are simply too thorough and massive to contest.
- 6 USSBS, "Statistical Appendix to Over-All Report (European War)," Feb 1947, 13; USSBS, "Summary Report (Pacific War)," 1945 (Reprinted along with "Summary Report (European War)" by Air University Press, 1987), 84.
- 7 Richard J. Overy, *Why the Allies Won* (London: Jonathan Cape, 1995), 203. Overy is recognized as one of the world's top military historians, but he is also an economic historian, which makes him especially authoritative when discussing air or sea power as forms of economic war.
- 8 *Ibid.*, 131.
- 9 Albert Speer, *Inside the Third Reich* (NY: Macmillan, 1970), 424.
- 10 USSBS, "Over-all Report (European War)," 18; Overy, 129.
- 11 Overy, 124.
- 12 Bernard C. Nalty (ed.) *Winged Shield, Winged Sword: A History of the United States Air Force*. 2 vols. (Washington: Air Force History and Museums Program, 1997), 1, 308. Correspondence from Alfred Price, 7 June 2002.
- 13 David T. Zabecki (ed.) *World War II in Europe: An Encyclopedia*. 2 vols. (NY: Garland, 1999), 1, 625.
- 14 USSBS, "Over-all Report (European War)," 95-96.
- 15 USSBS, "The Effects of Strategic Bombing on Japanese Morale," June 1947, 32.
- 16 *Ibid.*, 13; USSBS, "The Effects of Strategic Bombing on Japan's Urban Economy," March 1947, 25.

- 17 Overy, 133. Of interest, approximately 2.7 million British civilians left the major industrial cities during the war to escape the German bombing—which was on a far lower scale than was the Allied bombing of Germany. Richard M. Titmuss, *History of the Second World War: Problems of Social Policy* (London: His Majesty's Stationery Office, 1950), 345.
- 18 USSBS, "Over-all Report (European War)," 96; Overy, 132.
- 19 Irving L. Janis, *Air War and Emotional Stress* (Santa Monica: RAND, 1951), see especially chapter 7, "Aggression and Wartime. In other words, people living in the countryside did not believe that bombing affected their morale; those in the cities being bombed felt quite differently.
- 20 Bruce Lee, *Marching Orders: The Untold Story of World War II* (NY: Crown, 1995), see chapters 18-20 for a thorough examination of the various ULTRA/MAGIC messages that discussed the issue of Japanese surrender. The best overall treatment of this contentious issue, which focuses on Japanese sources, is Sadao Asada, "The Shock of the Atomic Bomb and Japan's Decision to Surrender—A Reconsideration," *Pacific Historical Review* 67(November 1998): 477-512.
- 21 Edward J. Drea, *MacArthur's Ultra: Codebreaking and the War against Japan, 1942-1945* (Lawrence: University Press of Kansas, 1992), 222. For a detailed and sobering examination of the actual US invasion plans, see Thomas B. Allen and Norman Polmar, *Code-Name Downfall: The Secret Plan to Invade Japan and Why Truman Dropped the Bomb* (NY: Simon & Schuster, 1995).
- 22 Lee, 491; Overy, 301.
- 23 Drea, 210.
- 24 "Almanac," *Defense*, September/October 1989, 47. These numbers are probably conservative. For the best discussion of this issue see D.M. Giangreco, "Casualty Projections for the U.S. Invasions of Japan, 1945-1946: Planning and Policy Implications," *Journal of Military History* 61(July 1997): 521-82.
- 25 George Feifer, *Tennozan: The Battle of Okinawa and the Atomic Bomb* (NY: Ticknor & Fields, 1992), 533.
- 26 The British official history states that 762,736 German civilians starved to death during the war and another 245,021 died of tuberculosis caused by the lack of fat, oils and milk in their diets—the absence of which were due to the blockade. A.C. Bell, *A History of the Blockade of Germany, 1914-1918* (London: His Majesty's Stationery Office, 1937), 672. The Germans maintained the number of dead was far higher, but in any event, the total does not include the civilians killed in Austria-Hungary and Turkey, where the effects of the starvation blockade were far more severe.
- 27 R.J. Rummel, *Death by Government: Genocide and Mass Murder in the Twentieth Century* (New Brunswick: Transaction, 1996), table 8.1, 148.
- 28 Van Waterford, *Prisoners of the Japanese in World War II* (Jefferson, NC: McFarland, 1994), 146.
- 29 USSBS, "Mission Accomplished: Interrogations of Japanese Industrial, Military, and Civil Leaders of World War II," 1946, 40. It should also be noted that the 8AF had transitioned into B-29s and recently deployed to airbases on Okinawa. Because of the shorter distances involved from these bases, versus the distance of 20AF aircraft based in the Marianas, the conventional bomb tonnage dropped on Japan was scheduled to triple beginning in September 1945.
- 30 *Ibid.*, 39.
- 31 *Ibid.*
- 32 USSBS, "Japanese Morale," 99.
- 33 "The Emperor's Rescript," *Current History*, September 1945, 191-92.
- 34 Overy, 125.
- 35 USSBS, "Over-all Report (European War)," 37.
- 36 *Ibid.*
- 37 Overy, 125.
- 38 *Ibid.*, 129.
- 39 *Ibid.*
- 40 Overy, 131; Speer, 278-79; and Sebastian Cox (ed.) *The Strategic Air War Against Germany, 1939-1945* (London: Frank Cass, 1998), xxxiv.
- 41 Overy, 129-31; USSBS, "Over-all Report (European War)," 37. Of the one million personnel manning air defense batteries, approximately \_ were regular Luftwaffe troops; the remainder were factory workers, what were termed "pre-military age" youths from 16-18, and Russian prisoners performing menial tasks.
- 42 Richard Overy, *Interrogations: The Nazi Elite in Allied Hands, 1945* (NY: Viking, 2001), 281.
- 43 USSBS, "Overall Report (Pacific)," 88.
- 44 *Ibid.*
- 45 USSBS, "Effects on Urban Economy," 11.
- 46 USSBS, "The Effects of Strategic Bombing on Japan's War Economy," December 1946, 2.
- 47 Craven and Cate, VI, 360; Holley, 550.
- 48 Cox, xxv.
- 49 "Almanac," *Defense*, September/October 1989, 47; Guenter Lewy, *America in Vietnam* (NY: Oxford University Press, 1978), 455.
- 50 Scape-goating was a common exercise in the decade after Saigon fell. For a discussion of a particularly prevalent view that it was weak-kneed politicians who actually lost the war, see Jeffrey P. Kimball, "The Stab-in-the-Back Legend and the Vietnam War," *Armed Forces & Society* 14(Spring 1998): 433-58.
- 51 Wait Rostow was an unusual case. As a major in the Office of Strategic Services (OSS), he was assigned to the Economic Objectives Unit in London because of his background in economics. There, he studied the German economy to determine the appropriate targets for Allied strategic bombers. In addition, Admirals Moorer and Felt were aviators.
- 52 Wayne Thompson, *To Hanoi and Back: The United States Air Force and North Vietnam, 1966-1973* (Washington: Air Force History and Museums Program, 2000), 23-24.
- 53 *Ibid.*, 21.

- 54Ibid., 63.
- 55 John P. Glennon (ed.) *Foreign Relations of the United States, 1964-1968*. Vol. 1: Vietnam, 1964 (Washington: Government Printing Office, 1992), 112-18, 713-17, 847-57; Thompson, vii.
- 56 Jim and Sybil Stockdale, *In Love and War* (NY: Harper & Row, 1984), 432.
- 57 Thomas H. Moorer, "The Decisiveness of Airpower in Vietnam," *Air Force Policy Letter for Commanders*, Supp. No. 11 (November 1973), 9, quoted in John T. Smith, *The Linebacker Raids: The Bombing of North Vietnam, 1972* (London: Arms and Armour, 1998), 174.
- 58 Lewy, 442-51. This total includes the 39,000 South Vietnamese that were assassinated by the Viet Cong, as well as the 65,000 Lewy states were killed by US air attacks in North Vietnam.
- 59 Thompson, 6.
- 60 "USAF Combat Sorties in Southeast Asia, January 1962 Thru December 1973," HQ AF/XOOCOAB Study, 5 April 1974.
- 61 Thompson, 14-19. Momyer was opposed to the Army's targeting of the B-52s, arguing that such missions were wasteful and indiscriminate. His arguments were waved aside: "Westmoreland's zeal for Arc Light strikes remained undiminished despite Air Force objections and a paucity of measurable results." John Schlight, *A War Too Long: The History of the USAF in Southeast Asia* (Washington: Air Force History and Museums Program, 1996), 31.
- 62 Eliot Cohen (ed.) *Gulf War Air Power Survey (GWAPS)*, 5 vols. and Summary volume (Washington: Government Printing Office, 1993), V, 227.
- 63 Ibid., 418.
- 64 Ibid., Summary, 15.
- 65 William M. Arkin, "Baghdad: The Urban Sanctuary in Desert Storm?" *Airpower Journal* (Spring 1997): 5-6; GWAPS, Summary, 226.
- 66 Ibid., 105-06.
- 67 Michael A. Carlino, "The Moral Limits of Strategic Attack," *Parameters* 32(Spring 2002): 15-29; Conrad C. Crane, "Sky High: Illusions of Airpower," *National Interest* 65(Fall 2001): 116-22.
- 68 Gil Elliot, *Twentieth Century Book of the Dead* (NY: Ballantine, 1973), 249.
- 69 Ibid., 154.
- 70 Ibid., 161.
- 71 Rummel, table 1.2, p 4. See also William Eckhardt, "War-Related Deaths Since 3000 B.C.," *Bulletin of Peace Proposals* 22(Fall 1991): 437-44.
- 72 Harrison E. Salisbury, *The 900 Days: The Siege of Leningrad* (NY: Harper & Row, 1969), 514-16. Salisbury states that over one million died due to starvation, with a total of between 1.3 and 1.5 million dying from all causes.
- 73 David Irving, letter to the *London Times*, 7 July 1966. Irving also notes that Nazi propaganda statements at the time cited figures of over 300,000 dead. Although this number has no basis in fact, it has been repeated by sloppy historians on several occasions since. Michael Sherry, for example, gives a truly astonishing figure of 600,000 killed at Dresden—thus doubling the figure of Joseph Goebbels himself! *The Rise of American Air Power* (New Haven: Yale, 1987), 260.
- 74 John G. Heidenrich, "The Gulf War: How Many Iraqis Died?" *Foreign Policy* 90(Spring 1993): 108-25.
- 75 UNICEF, "Child and Maternal Mortality Survey, 1999, Preliminary Report," July 1999, 10; Fourth Freedom, "Morbidity and Mortality Among Iraqi Children," March 1999, 1.
- 76 Colonel Robert C. Owen, *Deliberate Force: A Case Study in Effective Air Campaigning* (Maxwell AFB: Air University Press, 2000), 161.
- 77 Civilian Deaths in the NATO Air Campaign (NY: Human Rights Watch, 7 February 2000), 5.
- 78 Mark Bowden, *Black Hawk Down: A Story of Modern War* (NY: Atlantic Monthly, 1999), 333. Bowden notes that many of the frightened US soldiers stated they simply shot at anything that moved, spraying bullets at every window, every door, every street, every person: "especially people. They were all going down. It was a free-for-all now. All semblance of an ordered retreat was gone. Everybody was just scrambling." Bowden, 287.
- 79 Landmines: A Deadly Legacy (NY: Human Rights Watch, 1993), 3-4. The US State Department maintains that landmines killed or maimed 26,000 people per year in the 1990s. "Bush Administration Faces Decisions on Land Mine Programs, Treaty," *Inside the Army*, 5 February 2001, 1.

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