In Praise of Bomber Harris and Area Bombing

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Introduction

While few of even his most ardent critics would judge Sir Arthur Travers Harris, the longest-serving wartime commander of Royal Air Force (RAF) Bomber Command, as anything less than an outstanding war leader, this does not mean that his leadership was flawless or that it did not generate considerable controversy. However, those flaws need to be placed in perspective and measured against the wartime gains to Allied victory that were generated by the strategic courses of action he followed with such dogged determination. To that end, this article will attempt to address the majority of the controversial elements associated with his leadership, with overall emphasis upon the success/failure of the strategic area bombing campaign.

And Now, to War

For much of the war, the bomber offensive constituted for Britain and the Dominions the only viable form of offensive action against a thoroughly evil, repressive regime. Lacking a strong continental army, loath to revisit the abattoir of massive armies stalematied in bloody confrontation that had characterized the Western Front during the First World War, and realizing that a naval blockade of Germany was impossible in this war (due to the strength of the German navy), the bomber offensive became the only viable means of striking back. It provided a massive diversion to the Soviet allies at a time when none other was possible, and it constituted the very embodiment of an overall guerrilla warfare strategy, attacking the enemy on its peripheries, in this case its industrial centres.

From 1942 onwards, the Combined Bomber Offensive (CBO) was a highly effective, prolonged, cooperative effort between the American United States Strategic and Tactical Air Force (USSTAF) and the “British” or Bomber Command camps. While both camps at times placed the emphasis of efforts upon different components of the enemy’s war-making capabilities, there was a tremendous amount of overall synergism and mutual support. For example, the combined efforts of Bomber Command and the USSTAF ultimately destroyed
virtually all of Germany’s coke (which is coal after the removal of associated gases), ferroalloy and synthetic rubber industries; 95 per cent of its fuel, hard coal and rubber capacity; and 90 per cent of its steel-making capacity. Conversely, Bomber Command attacked many precision manufacturing targets during the course of the war.

Very early on, Bomber Command determined that daylight attacks were cost prohibitive in terms of aircrew and aircraft losses, accepting the fact that the protective mantle of darkness would also, until improvements could be made, adversely affect navigation and bombing accuracy. Then followed a long period of changing attack priorities and lacklustre, indecisive bombing results. And, in terms of policy inputs from senior leadership, as early as 8 July 1940, Churchill had written:

When I look round to see how we can win the war I see that there is only one sure path. We have no continental army which can defeat the German military power. The blockade is broken and Hitler has Asia and probably Africa to draw from. Should he be repulsed here or not try invasion, he will recoil eastward, and we have nothing to stop him. But there is one thing that will bring him back and bring him down, and that is an absolutely devastating, exterminating attack by very heavy bombers from this country upon the Nazi homeland.

In counterpoint, on 9 October 1940, after repeated attacks upon the British cities, Reichsmarschall Hermann Göring, Commander-in-Chief of the Luftwaffe, made public a plan to not only obliterate London and demoralize its citizens by bombardment but also paralyse Britain’s broader industrial and commercial capabilities. In sum, therefore:

Inch by painful inch, both British and German policies were slipping from ones aimed at precise objectives to ones of area bombing with psychological overtones. On 2 September, for example, Portal [Sir Charles Portal, Air Officer Commanding-in-Chief (AOC-in-C) Bomber Command] observed that although he was not yet involved in attempts to burn down whole towns, “that stage would come.” The next day Churchill asked that Bomber Command “pulverise the entire industry and scientific structure” of the German war economy; and, three days later, he called for a series of “minor” but “widespread” attacks on smaller German towns intended to destroy the population’s faith in their air defences.

While enemy oil assets continued to be a high priority target when the weather cooperated, on 9 July 1941, yet another policy directive postulated that “the weakest points in [the enemy’s] armour lie in the morale of the civilian population and in his inland transportation system.” This directive would pave the way for even broader policy changes, and henceforth, Germany would be bombed more frequently, with greater intensity and with less target discrimination.

Throughout the first half of 1941, it was becoming increasingly obvious that the night campaign was not meeting damage expectations. Delivery accuracy was still woefully inadequate. A 1941 analysis commissioned by Churchill’s
scientific advisor, Frederick Lindemann (later Lord Cherwell), and known as the Butt Report ultimately stressed the need to examine bombing techniques and to improve navigational procedures, as the only realistic alternative—massive daylight raids—was considered just too dangerous.

In sum, the Butt Report deemed the bombing—with respect to accuracy and results obtained for the costs
incurred—pathetic. In the near future, in acknowledgement of existing and anticipated capabilities, less target discrimination would be demanded and more aids to navigation and targeting would be developed. Lord Cherwell, a firm believer in the efficacy of area bombing and in full agreement with the Butt Report, presented a seminal paper to Cabinet that advocated area bombing as the keystone of a concentrated strategic bombing campaign against the Axis forces. The plan proposed attacking Germany’s industrial centres in order to destroy as much working-class housing as possible in order to displace the German work force and to disrupt/reduce their ability to work.  

The next pivotal bombing policy direction came on 14 February 1942, with the release of Policy Directive #22. Issued by Air Chief Marshal Sir Charles Portal, former AOC-in-C Bomber Command and now Chief of the Air Staff, and as a direct result of the Butt Report and Cherwell’s approved Cabinet presentation, Portal mandated that, henceforth, the primary objective of Bomber Command was to be “the morale of the enemy civil population and in particular, of the industrial workers.” These attacks were to be manifested as large raids upon selected area targets in the major industrial areas of Germany, and while industrial, military and infrastructure aim points were always to be identified and specified, collateral damage in terms of “dehousing” the civilian population was considered an acceptable, indeed a desirable, adjunct to the bombing. The Ruhr area, especially Essen, as well as Berlin, were considered of primary interest. Further, “to make sure there was no misunderstanding about what was being called for, the next day Portal told his deputy to tell Bomber Command Headquarters that ‘the aiming points are to be the built-up areas, not, for instance, the dockyards or aircraft factories where these are mentioned.’” This last point deserves emphasis, for it acknowledges the command’s non-precision capabilities at this particular point of the war as well as the generalized propensity in the Western world for building up suburbs around industrial complexes. It is also important to understand that aiming for the hub of an industrial city was likely to inflict damage upon key transportation and communications nodes, such as telephone and telegraph command services, railway stations and marshalling yards, since they tended to be centralized within urban developments.

And while it is probably fair to say that urban centres of the industrial cities were the default aim point of Bomber Command throughout much of the war, it must be emphasized that the industrial city bombing constituted only a portion of the command’s efforts. To be precise, of Bomber Command’s wartime total of nearly 1,000,000 tons [907,000 tonnes] of ordnance expended—or half the Anglo–American aggregate dropped upon the Third Reich and its proxies—only 431,000 tons [391,000 tonnes] (43 per cent) were dropped upon the industrial cities. Quite simply, Bomber Command was not a force dedicated to the assault of Germany’s economic system.

A NEW HELMSMAN

On 24 February 1942, Arthur Harris became the AOC-in-C of Bomber Command. Throughout the war, Harris would remain hostile to the concept of “panacea” targets, specific elements
of the enemy’s military, industrial and infrastructure capabilities and capacities that, if totally eliminated, would destroy its ability to wage war. And although the accuracy of Bomber Command increased remarkably over the course of the war, Harris believed that an enemy economy and social structure could not be dislocated, thus forcing a political decision to capitulate, by an attack on any single element. Electronic aids, sophisticated marking techniques, stabilized automatic bomb sights, vastly improved weaponry as well as highly refined and sophisticated attack tactics would significantly improve delivery accuracies over the course of the war for Bomber Command’s main force, although many of these refinements would not fully blossom until the closing months of the European war. However, with the exception of several highly specialized, precision-attack units (such as 617 and 9 Squadrons flying Lancasters and 106 Squadron of the Light Night Striking Force flying Mosquitos), the bulk of Bomber Command remained “a blunt instrument,” generally incapable of attacking targets with the uncanny precision, accuracy and reliability of today’s forces and munitions. This in mind, Harris pursued a broader strategy that he believed would use that instrument to best effect, and his dogged obstinacy to reject all specific, exclusive types of targets (notably ball bearings but particularly oil) would become the main objection to his wartime leadership of the command.9 However, in fairness to Harris, he had sound reasons for applying his broader strategy.

The next pivotal policy determinant was “The Report on the Bombing of Germany,” written by an independent assessor, Mr. Justice John Singleton. While Singleton’s report played down the view that area bombing could win the war by itself, he believed it would impede the German war effort and would also provide much-needed relief to the Soviet Union. He asserted that Germany’s war efforts could be limited and hampered by attacks upon factories engaged in war work as well as by damage to communications grids and public utility services. Reports of the period coming in from citizens of neutral countries visiting the Third Reich tended to bolster this view. Singleton believed that significant gains could be realized by tying-down enemy resources required to defend against the bombing threat and repair bomb damage, and he offered that enemy morale was also likely to be adversely affected by the bombing. He also saw a need for more sophisticated target identification devices that were unaffected by atmospheric conditions, and he recommended the establishment of a specialized target identification force.10

Harris and his planners took great heart from these findings, and accordingly, in August, a specialized target identification and marking unit was officially established as the Pathfinder Force, #8 Group. Through trial and error as well as the development and implementation of innovative techniques and equipment for target detection and marking, the Pathfinders would significantly enhance the accuracy of the main-force bombing, particularly during the closing hours of the European war.

On an encouraging note for Bomber Command during 1942, there was a growing body of evidence that, in spite of the direct damage to German industry caused by the bombing raids, “the most serious problem confronting the German authorities [was] that of re-housing the
bombed-out population and providing them with clothing and other necessities of life.” Again, various source inputs appeared to be providing compelling proof of the validity of area bombing. Citing a well-placed, clandestine source of the period, in close touch with the Reichsluftfahrtministerium (RLM or German Air Ministry):

At the moment the fear of the RAF giant raids is far greater than any anxiety about an invasion … . These big raids cause mass destruction. In spite of the statements in the Wehrmacht reports, the destruction of war production facilities is fairly considerable. The loss caused by the destruction of food stores and depots is extraordinarily great, as the food cannot be replaced. The effect on the civil population of such raids is not to be underestimated. In Köln (Cologne), there were between 3000 and 4000 dead [officially only just over 100 were reported], which of course the population of Köln knew very well. They spread the information, and this undermines confidence in the reports of the Wehrmacht. In Köln there were at least 200,000 persons rendered homeless, who for the most part have been evacuated, as in the city itself no new buildings or temporary premises could be erected quickly enough. The problem of the homeless people is the most difficult. There is a shortage of houses and accommodation everywhere, in the country as well as the towns. As a result, wooden hutments have to be erected everywhere … . In the RLM there are officers of high rank and influence who seriously fear that the winter will see unrest and demonstrations, unless the mass raids are successfully dealt with. But if the SS [Schutzstafel] has to be used against the civil population, a deplorable situation will arise. According to these officers the great danger is not an invasion, but the systematic destruction of German towns by the RAF.\footnote{12}

The importance of bringing forward excerpts from these source documents is to make the point that the bombing offensive was evolving and developing, based upon capabilities, analysis and direct feedback from reliable intelligence sources. Bombing policies were not being developed in a void.

At this point in time, a few words with respect to Harris’s relationship with his wartime charges as well as his method of command are perhaps appropriate. Although Harris was not able to visit his aircrew and ground crew as frequently as he would have wished, he still managed to win and hold their respect, loyalty and trust, even when they were faced with the most daunting odds, and he cared deeply about his people. Harris’s biographer, Air Commodore Henry Probert, elaborates:

Harris’s firmness could easily be seen by others as stubbornness and obstinacy; his single-mindedness could come across as an inability to see others’ points of view or to appreciate the wider political and military constraints; his all too frequent exaggerations, usually intended as a means to emphasise his views, were often considered as lapses of judgment. There is truth in such criticisms, and despite his good work in his two Air Ministry tours of duty he was never cut out for top level
staffwork, as he himself knew. He was essentially the sort of commander who emerges in a crisis, one for which his knowledge and experience happen to have particularly prepared him. …

Yet all too often Harris continues to be portrayed as the hard, insensitive man, totally concentrated on using his bombers to beat the enemy by destroying his homeland, and unconcerned about the implications for the human beings involved. This is far from the truth. Certainly he could be remote and difficult at times but the many who knew him, especially away from the immediate business, found him kind, generous, humorous, compassionate, amply possessed of the human touch. He did care for people, and never more than the men who served under him—including, most importantly, those who came from the nations of the Commonwealth and elsewhere. Towards the enemy, while he hated the slaughter involved, his feelings were dominated by the conviction that the war must be won as quickly as possible, in their interests as much as in those of his own compatriots.¹³
Commencing in July 1942, Britain and the Dominions would no longer find themselves alone in their bombing campaign against the Reich. With characteristic American vigour and enthusiasm, the “Mighty Eighth” Air Force of the United States Army Air Forces (USAAF) had begun a rapid build-up in southern and central Britain. Between the Eighth Air Force and the many stations occupied by Bomber Command, the little island nation was soon transformed into a vast, stationary aircraft carrier. Ultimately, the American contribution would be huge, and from January 1944 onwards, the Eighth Air Force would be joined by heavy bombers of the Fifteenth Air Force, operating from bases in North Africa and Italy. By early August 1942, advance crews of the Eighth had been pronounced combat ready, but based upon their own early war experience, the British remained highly sceptical of the American daylight-only, massed-formation tactics.

Nonetheless, in spite of British concerns, the Americans were bound and determined to implement a daylight bombing strategy. At the Casablanca Conference of January 1943, a working, synergistic bond was formed that would provide the blueprint for the cooperative effort that would characterize the bomber war over Europe until the end of hostilities. After Churchill and Roosevelt had reaffirmed their overall “Germany First” plan to defeat the Third Reich and its cronies prior to “finishing the job” in the Pacific, a strategic compromise was struck to carry the land war next to Sicily and Italy, continuing to attack the enemy on its peripheries but postponing a cross-Channel invasion for the time being. Meanwhile, the combined forces of Britain, the Dominions and the United States would mount a mighty CBO against targets in the greater German Reich, the European Axis powers and Occupied Europe. Sir Charles Portal, in particular, as Chief of the Air Staff, firmly believed that the CBO would render 25 million Germans homeless and, more importantly, would bring war production to a complete standstill. This campaign would entail “the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened.” Within that general concept, the primary objectives at that time, subject to the demands of weather and tactical feasibility and in order of priority, were to be German submarine construction yards, the German aircraft industry, transportation targets, oil plants and other targets within the enemy war industries. Every opportunity was to be taken to attack Germany by day, destroy objectives that were not suitable for night attack (in other words, the American mandate), sustain continuous pressure upon German morale, impose heavy losses upon the German day fighter force, and contain German fighter strength and keep it away from the Soviet and Mediterranean theatres of war.

“Bombing around the clock” became an enormous Anglo–American strategic cooperative effort which lasted for the following 16 months until the spring of 1944, when Bomber Command would be seconded temporarily to Supreme
Headquarters Allied Expeditionary Forces (SHAEF) under General Eisenhower, flying in support of the planned D-Day landings in France.

Within the overall broad strategy that had been agreed upon at Casablanca, the two Anglo–American bombing armadas would place their operational emphasis upon different mandated priorities with respect to the enemy’s resources at different periods of the campaign, although there was also a great amount of synergism and overlap conducted throughout. Nonetheless, until Bomber Command was seconded to SHAEF in April 1944, it tended to favour attacks upon the broader Axis industrial base, particularly the primary industries and associated infrastructure that supplied and fuelled the precision manufacturing element, such as production of coal, steel and pig iron as well as transportation nodes, power sources and mines. By contrast, the Americans preferred direct attacks upon the aircraft-manufacturing and ball-bearing industries and enemy oil resources. However, readers must bear in mind that Bomber Command had previously identified enemy oil as a significant target much earlier in the war but had temporarily abandoned pursuit of this target due to the pinpoint accuracy required to successfully attack the refineries and the concomitant inconsistency this presented with the night area-bombing strategy. Thus commenced in earnest the great, cooperative aerial onslaught against Hitler’s Festung Europa (Fortress Europe). It would result in over 2,000,000 tons [1,814,000 tonnes] of ordnance being dropped upon European Axis targets. However, it would also demand a very high toll in aircrew blood, including over 81,000 total wartime aircrew fatalities from RAF Bomber Command and the USAAF.
Command had already expended, as we have seen, considerable time and effort with respect to enemy oil. Furthermore, the relative accuracy required to hit these targets was hampered in both the American and the Commonwealth camps by the vagaries of northern European weather during the period. That said, by late autumn 1944 and throughout 1945, Bomber Command was actually outdoing the Americans in sorties against enemy oil assets. However, according to Probert:

He [Harris] was still deeply suspicious of the prognostications of the Ministry of Economic Warfare; synthetic oil production was spread over many plants, often small, in different parts of Germany, and up-to-date intelligence about them was hard to obtain; the Germans under Speer were adept at dispersal and repair; and effective attack required a degree of accuracy which he was far from convinced his aircraft could achieve, especially against more distant targets.\(^{15}\)

As Harris himself later recognized, oil did prove more critical than he had judged at the time. Influenced by the views of Albert Speer, Hitler’s Armament Minister, Harris wrote in 1947 that in the final weeks of the war all the German armed forces had been immobilized for lack of fuel, rendering the triumph of the oil offensive complete and indisputable. It was the one panacea that actually paid off.

Nonetheless, there is no doubting the ultimate success of the Oil Plan, and it remains an unanswerable question as to just how much, if at all, the European war could have been shortened had Harris embraced the plan with more enthusiasm at the outset. That said, in spite of the aforementioned differences of opinion, the counter-oil campaign was a highly successful cooperative effort.

**The War Against Enemy Transportation**

An earlier joint effort known as the Transportation Plan also proved to be a very effective precursor to the Normandy landings. Designed to disrupt rail communications by attacking some 74 key rail centres in France and Belgium as an obvious Operation OVERLORD priority, on 15 April 1944, Bomber Command was allocated 37 of the rail targets; the other half were assigned to the Americans. By the eve of D-Day, some 60 separate attacks had put at least two-thirds of the assigned Bomber Command targets out of action for a minimum of a month, a much better record than that accomplished by the Americans against their assigned targets.\(^ {16}\) And continued, unrelenting pressure by the strategic bombing forces upon Axis road, rail and waterways from this point onwards until the end of hostilities would yield very tangible results against an enemy transportation network that was already stretched to the limit, due to the dynamic and changing operational requirements and the tremendous additional burden of forced industrial decentralization, which had been brought about by the bombings.

With respect to the overall transportation campaign, Bomber Command’s deliberate area bombing of industrial city centres from early in the war generated a high, prolonged and sustained degree of damage to core road and rail assets, a much more concentrated degree of damage than that waged by the sporadic attacks of the Americans until
they specifically targeted enemy city centres later in the war. Downstream from the pre-OVERLORD attacks, Bomber Command devoted extensive resources against enemy transportation networks and facilities. Perhaps none were more effective than the attacks upon the German waterway systems, particularly those on the Rhine River and the Dortmund Ems Canal. During the last four months of the war, Bomber Command devoted 15.4 per cent of its total efforts against enemy transportation assets. And between October 1944 and March 1945, the attacks on both rail and water transportation networks were so effective that the Germans could scarcely manage 12 per cent of throughput of critical resources to the industrialized Ruhr, and this included the near-total curtailment of coal. Also due to strategic bombing, the virtual collapse of the transportation networks by 1945 meant that Germany’s still-enormous field armies could no longer be reliably supplied or armed.

Pounding the Reich

It was during the last calendar year of the war that Bomber Command reached its most productive and destructive apex. Back on 3 November 1942, as a precursor
to the Casablanca Conference, Portal, with a major input from Harris, had presented the British Chiefs of Staff with a blueprint for a joint Anglo–American bombing offensive, which based their bombing strategy on the assumption that a combined bomber fleet of 4,000–6,000 aircraft would be continuously available. And 1944–1945 was decisive for the strategic bombing campaign, with over two-thirds of the total wartime bomb tonnage being dropped on the greater German Reich from July 1944 onwards. Also, along with vastly declining German defensive capabilities, due in no small measure to the overrunning of German early warning sites in the land battle for the Continent, Bomber Command’s monthly average number of sorties increased from 5,400 in 1943 to 14,000 in 1944, and their average payload-per-sortie nearly doubled. And from the summer of 1944 onwards, once relative air superiority had been attained over Northwest Europe, Bomber Command would complement its night attacks with more frequent daylight operations.

At this point, the frequently misunderstood concepts of American precision, daylight bombing and British night area bombing need to be addressed and placed within a proper context.

In point of fact, from late-1943/early-1944 onwards, both the British and the Americans were area bombing or “blind bombing,” as it was referred to in USAAF circles. From the official USAAF history:

Approximately 80 percent of all Eighth Air Force and 70 percent of all Fifteenth Air Force missions during the last quarter of 1944 were characterized by some employment of blind-bombing radar devices. Without these aids important targets would have enjoyed weeks or months of respite and on several occasions major task forces failed even with radar to reach their objectives because of adverse weather … . In mid-November 1944, operations analysts of the Eighth estimated that nearly half the blind missions were near failures, or worse.

Richard Overy takes this point even farther: “The US air forces soon abandoned any pretence that they could bomb with precision, and two-thirds of their bombs were dropped blind through cloud and smog. A staggering 87 percent of all bombs missed their target.”

In their defence, weather conditions over the European continent were forcing the blind-bombing option upon both camps. It is ironic, however, that while the USAAF had commenced in earnest to make area attacks from late-1944 onwards, Bomber Command, on a selective basis, was now making precision attacks, both night and day, upon specific military and industrial targets. Technological advances abounded. Gee-H represented a quantum leap in the development of navigation systems, since it combined levels of accuracy comparable to Oboe with the universal applicability of Gee. It had been introduced to service by 3 Group in 1943, and it was eventually used by other formations. Around the same time, the K-band H2S Mark VI radar was also fielded, and this alleviated some system limitations over poorly defined or obscured targets. Furthermore:

Bomber Command coupled these new devices with revised tactics. Navigation was now so accurate that
decoy fires and spoof raids could be used within a few miles of the actual route. The navigators and bomb-aimers were now sufficiently skilled to use an offset bombing point chosen for its visibility, and to aim their bombs at a given range and bearing from that point.\textsuperscript{24}

**THE FINAL ROUND**

By 1945, target-marking techniques in Bomber Command had reached new levels of maturity and sophistication, including the increasing use of offset tactics. The offset procedure reduced the predictability and, thus, the vulnerability of the attacking bombers. Also, multiple streams consisting of simultaneous large-scale efforts on different targets were common by 1945, further confusing the defences and further reducing predictability. By this stage of the war, given the predominating weather over the Continent, Bomber Command had acquired so much expertise in blind bombing and the innovative use of radar and other electronic aids that its most experienced crews were generally as comfortable bombing in obscured conditions at night, with comparable results, as they were when bombing “in the clear” by daylight. For their part, the Americans had accepted that weather, navigation and target finding were significant problems affecting operations.

By early 1944, the Eighth Air Force had come to rely extensively upon “blind” attacking targets by Oboe and by H2X.\textsuperscript{25} In fact, “on only one occasion in six weeks [during January and early February 1944] were the skies clear enough for visual bombing.”\textsuperscript{26} And that reliance upon electronic aids would only increase during the rest of the bombing campaign. By early 1945, in a further broad distillation of precision bombardment and a tacit acknowledgement that area attacks had become accepted American strategy, a new crew member known as the “togglier” frequently replaced the much more extensively trained (and usually commissioned) bombardier in American bomber crews.

**Dresden**

Operations by both Bomber Command and the USAAF on 13/14 February 1945 against Dresden resulted in massive destruction and loss of life. Conditions combined to produce a true firestorm, one of just three that occurred in the European theatre, the others being at Hamburg in July 1943 and then at Kassel in October 1943.

Dresden. … The city, and its very name, has become a poster child for the opponents of the area-bombing campaign, but there is a lot of mythology that has been generated over these late-war raids. While it is true that the bombing destroyed much property and thousands of German lives, the number of fatalities was greatly exaggerated from the outset (by a factor of up to 1,000 per cent)\textsuperscript{27} in an extremely effective propaganda campaign waged by the German Propaganda Ministry through the neutral countries and the United States and then later by the USSR during the cold war.

And contrary to popular belief, Dresden in 1945 was far more than just a beautiful baroque centre of cultural significance. It was also an armed camp and was home, most importantly, to a vital communications and transportation
hub as well as a control node for the resupply and sustainment of Eastern Front operations. In addition, it hosted scores of embedded factories that produced goods vital to the German war effort, including the massive Zeiss-Ikon complex. Furthermore, it had been a long time since Zeiss-Ikon had produced anything as innocent as a holiday snapshot camera. Dresden, in short, was a highly legitimate military target.28

A CERTAIN DOPPLICITY

However, by the spring of 1945, the eddies of public disquiet generated by the Dresden bombings were swirling. By late March, perhaps with an eye cast towards his legacy, Churchill penned a minute to his senior uniformed chiefs which Bomber Command’s eventual historians would later consider “perhaps the least felicitous,” well-expressed or appropriate of all the prime minister’s wartime correspondence.29 The minute appeared to endorse all the latest public criticism of Allied bombing policy, and it also seemed to shift the blame from the prime minister’s shoulders to those of the air commanders responsible for implementing the policy. The implication was that Churchill had been misled and that his air leaders were conducting terror bombing on their own initiative, without his knowledge, but both conditions were patently false.30 Portal immediately solicited Harris’s comments, who vehemently objected to the minute, deeming it a serious slight against his aircrews who had endured so steadfastly throughout the campaign. Churchill also appears to have exercised a conveniently selective memory when he penned the
offending minute, choosing to ignore the various telephone conversations, memos and directives to the Secretary of State for Air, Sir Archibald Sinclair, in January which had urged bombing attacks upon the eastern cities. “Churchill was well aware that the RAF was going to attack Dresden …; the decision to do so had originated in Cabinet and had his full support.”31 Also, his enthusiasm for using bombing as a punishment had led to excesses in rhetoric on occasion, and they frequently required others, including Harris, to set Churchill’s moral compass straight. The repeated considerations of reprisal raids in response to the German razing of Lidice, Czechoslovakia, in 1942 and the Crossbow campaign against the V-weapons in 1944 constitute ample proof of this trend in the prime minister’s behaviour.32 Ultimately, Portal enthusiastically endorsed Harris’s views with respect to the Dresden raids, in particular, and with respect to area bombing, in general. Sir Archibald Sinclair then asked Churchill to withdraw the offending minute, and on 1 April 1945, Churchill substituted a replacement note. The revised minute contained no further reference to either terror attacks or to the raid on Dresden. Nonetheless, the damage had been done, and in spite of Chairman of the Chiefs of Staff Lord Ismay’s assurances to the contrary, the first minute also remained on file, and the effects of public scrutiny and analysis of it in future would be far-reaching.33

**With a View to the Future**

As spring 1945 continued to unfold, the prime minister’s newfound determination to put an end to the bombing of the German cities, undoubtedly fuelled by concerns for both his legacy and his political future, took effect rapidly. The Air Staff recommendations that fell out of the prime minister’s wishes were subsequently approved up the chain of command, and Sir Arthur Harris was so informed on 6 April. However, Portal very clearly articulated the purpose of, the justification of and the caveats under which area bombing could, if necessary, still be conducted. Portal has been cited frequently, like Churchill, as having an eye to the historical record and distancing himself from Harris and Bomber Command’s campaign against the industrialized cities. However, in spite of the aforementioned disagreements with Harris, Portal staunchly defended him to those in higher authority, and he made it very clear that area bombing still had its place. He remained convinced that it was useful under certain circumstances, even at that late stage of the war. He also made it clear that Bomber Command’s precision attack-capability was relatively newfound and that, even with all the technological and tactical advances, it had its limitations, as precision-bombing capabilities were still not widely practiced by the bulk of the main force.34

Shortly thereafter, hostilities in Europe would conclude, but a vast amount of unfinished business still remained in the Pacific theatre. Strategic bombing had truly come of age in the European theatre of operations, and many of the bloody lessons learned there would soon be applied to telling effect against the Empire of the Sun.
in Europe was its influence upon the war against the Japanese empire. In the Pacific theatre, B-29 Superfortresses started pounding the Japanese home islands from bases in the Marianas in late-1944. However, their attempt at precision bombing from high level using high-explosive weaponry proved relatively ineffective. Early in March 1945, they borrowed a page from the area-bombing methods honed in Europe; abandoned attempts at precision bombardment; and switched their bomb runs to delivery from medium level against area targets, commencing with incendiary laydowns. The high-water mark of these raids was that conducted against Tokyo on 9/10 March 1945, which left nearly 125,000 killed and over a million homeless. Overall, by war’s end, most major Japanese cities had been laid to waste, and 42 per cent of the nation’s industrial capacity had been destroyed.\(^\text{35}\) Intensely demoralizing, these raids brought Japan to the brink of surrender. And yet, based upon the fierce determination to resist an Allied invasion of the home islands, the Allied Executive was gravely concerned about the blood costs to both sides should an invasion of the home islands prove necessary.

By the summer of 1945, extensive planning was taking place for Operation DOWNFALL, just such an invasion, and on a scale dwarfing that accomplished on D-Day. It was scheduled for commencement on 1 November 1945, initially through the southernmost island of Kyushu. Recent and compelling research makes the point that the true estimates Allied planning forces were working with at the time with respect to their anticipated losses were 1.7–4 million casualties.\(^\text{36}\) Indeed, the Japanese Supreme War Council was determined to commit the nation to mass suicide if necessary, calling “for the sacrifice of up to 100,000,000 Japanese lives, if necessary, to repel the Allied invasion of the home islands.”\(^\text{37}\) The area bombing of Japan had certainly dealt a debilitating blow to the Japanese war industries, and the remaining factories were on the verge of collapsing for want of component parts and damage to infrastructure. However, there was also no shortage of suicidally inspired pilots available and willing to substitute courage for technological inadequacy and to dive their aircraft into a massed Allied invasion force. Furthermore, “orders went out that every Japanese man between the ages of 15 and 60 and all women aged 17 to 40 would meet the invaders at beaches with sharpened bamboo poles. Allied peace feelers were rejected.”\(^\text{38}\)

At home, all the Allied nations were becoming increasingly weary in light of the extensive casualties endured during the last calendar year of the European and Asian wars and the economies that had been excessively “tapped” by war expenses. Labour unrest was intensifying, particularly in Britain. Therefore, the perceived cost of invading the home islands, both in America and in Britain, posed serious challenges to public will and support. Although it was a painful decision for the Allies, the two atomic drops on Hiroshima and Nagasaki—the epitome of strategic area bombardment—with the concomitant loss of an additional 150,000 Japanese citizens—and many more to follow from radiation poisoning—when combined with a rapidly worsening war situation, the entry of the USSR into the Pacific war, and the continued decimation of the industrial cities, all helped convince the Japanese that further resistance
was pointless. Defending against massed fleets of formidable, heavily protected B-29 Superfortresses was difficult enough, but the atomic drops helped convince the Japanese that they were relatively powerless to defend the entire nation from the high and fast flying, singly penetrating B-29s that could be using atomic weapons on any part of the nation, the ultimate shell game, to draw an analogy.

Finally, on 10 August 1945, the Japanese stated that Imperial Japan would accept the surrender terms previously announced at the Potsdam Conference, provided the Allied powers explicitly allowed Emperor Hirohito to remain as the country’s sovereign ruler. The underscoring of the futility of further resistance plus the guaranteed preservation of the Japanese monarchy spared the Japanese people from the obligation of being killed to the last available man and woman. Therefore, strategic area bombing, honed in the European war, undoubtedly played its part in preventing many casualties, both Allied and Japanese, by helping to eliminate the need for an armed invasion of the Japanese mainland, the costs of which, measured by any yardstick, would have been horrific.

The Balance Sheet

Critics of the bomber offensive suggest that the materiel and human cost of the campaign far overshadowed the gains and that the resources dedicated to it could have been more effectively utilized elsewhere. They have argued that the combat manpower could have been better used in the other fighting services, especially by the army during the gruelling campaign in northwest Europe, and that industry could have been used to produce more weapons for these fighting services. However, proponents of this line assume that the weight of effort expended upon the bombing campaign was inordinately high. Overy maintains that it was actually rather modest. “Measured against the totals for the entire war effort (production and fighting), bombing absorbed 7 per cent, rising to 12 per cent in 1944–45. Since at least a proportion of bomber production went to other theatres of war, the aggregate figures for the direct bombing of Germany were certainly smaller than this. Seven per cent of Britain’s war effort can hardly be regarded as an unreasonable allocation of resources.”

Further, some Bomber Command squadrons were in fact seconded to Coastal Command for limited patrol duties, but Bomber Command’s operational fleet was not particularly suited to long-range maritime patrol. As it was, these secondments diluted the resources of the command when it was still not at its fully effective strength. Aerial relief in the North Atlantic, in the form of closing the so-called “black hole” of patrol coverage, would eventually be provided through the acquisition of very-long-range Consolidated B-24 Liberator patrol aircraft, a type not included in Bomber Command’s inventory in Europe.

Much of the criticism of the bombing campaign has focused upon the human cost, the unquestionably heavy loss rates endured by Anglo–American aircrews, 81,000 of whom forfeited their lives aboard 18,000 downed aircraft from the Eighth Air Force and Bomber Command alone. On the Axis side, approximately 593,000 non-combatant fatalities are attributable to the bombings. However, these losses need to be placed in
perspective, especially when compared to 20–27 million war dead suffered by the Soviet Union. Nonetheless, the human cost of the campaign was formidable.

During the war, Bomber Command’s 125,000 airmen flew 364,514 sorties over Europe, and the majority of the command’s tonnage was dropped from the summer of 1944 until the cessation of hostilities. Approximately 74 per cent of the total tonnage was delivered after 1 January 1944, and 70 per cent of the total after 1 July 1944, from which time forward the Bomber Command loss rates were greatly reduced. “If the bombing of Germany had little effect on production prior to July 1944, it is not only because she had idle resources upon which to draw, but because the major weight of the air offensive against her had not been brought to bear. After the air war against Germany was launched on its full scale, the effect was immediate.”

The contributions to victory of the Bomber offensive

The gains not only were those directly attributable to the bombing, such as the actual destruction of targets, but also constituted a host of indirect benefits brought on as adjuncts to the bombing. While part of the bombing effort was to be directed at Germany’s home-front military and economic structures, very large portions of the overall effort were directed at many other targets for which Bomber Command’s aircraft were needed. As Overy has mentioned, not even half the Command’s total wartime dropped bomb tonnage was dedicated to the industrial cities. Also, during the latter stages of the campaign, even attacks against industrialized cities were frequently tactical rather than strategic, conducted in support of the advancing Allied land armies. For much of the first four years of the war, support for naval operations—particularly the mining of enemy littoral waters and the Western Baltic Sea, attacks against the U-Boat production and operational facilities as well as the destruction of six German capital ships (the entire Royal Navy only destroyed four)—comprised a significant portion of Bomber Command’s overall effort, while for much of 1944, it was extensively used in support of the invasion of northwest Europe. Additionally, Bomber Command aircraft were utilized for reconnaissance, propaganda missions, electronic warfare and deception operations, support to Occupied Europe’s resistance movements as well as humanitarian aid and mercy missions towards the end of hostilities. Bomber Command was a true jack of all trades, and it required the full resolution of its commander, Sir Arthur Harris, not to become excessively and repeatedly diverted from its primary mandate, due to all the competing demands upon its limited resources.

That said, and with the benefit of “20/20 hindsight,” while Arthur Harris was undoubtedly correct in his assessment of the need for a broad application of area bombing during most of the campaign, his dogged rejection of the so-called panacea targets later in the war appears to have been somewhat myopic. Albert Speer and others dreaded timely follow-on efforts to the highly successful 1943 attacks on the Ruhr dams, Hamburg and the ball-bearing industry, and they believed that such a concentration of effort at the time would have been cataclysmic for the Reich. Similarly, an earlier and more dedicated application of effort
against the enemy’s oil resources, which pitted the Commander-in-Chief Bomber Command against the Chief of the Air Staff, might have brought the European war to a somewhat earlier conclusion. But such is the fog of war, and Arthur Harris sincerely believed he was following the correct course and was utilizing his command to inflict the most damage under the circumstances presented to him.

Furthermore, British historian Robin Neillands believes that, unlike the later atomic drops upon Japan, Harris simply did not have the weapon to devastate Germany in a manner that would concomitantly crush the German will to resist. Neillands offers that Harris:

was also hindered throughout his campaign by a classic piece of military miscalculation, a failure by the Allied Combined Chiefs of Staff to maintain the aim.

The aim of Bomber Command operations, [apart] from the time they began in 1939, was to carry the war to the heart of the enemy homeland. That was what the strategic bomber was for, and no one in authority disputed this. [Churchill had said,] “There is one thing that will bring him (Hitler) down, and that is an absolutely devastating, exterminating attack by heavy bombers on the Nazi homeland. ...” ... [But] what [Harris] needed was more aircraft and a free hand.

Instead, there was a failure, at all levels, to maintain this intention and carry it through. The main failure lay in not providing Bomber Command with the wherewithal to carry out this declared intention; it was not the fault of Air Chief Marshal Harris. From the earliest days of the war there was a continual diversion of bomber strength, with aircraft and crews sent to North Africa and Italy, to Coastal Command and to the Far East. This steady drain prevented Harris from ever achieving the size of force he needed to carry out the instructions he was given.44 [emphasis in original]

The bomber offensive made possible a combat initiative that was deemed vital, not just for the damage it would cause the Third Reich but also for the galvanizing of both British and global support. It affected American and Commonwealth opinion as well as that of potential allies and enslaved nations, telegraphing British resolve to forcefully press home the fight against the tyranny of Nazism, alone if necessary. Its very prosecution assured Britain a pivotal say in the conduct of the war. It also did wonders for home-front morale, bolstering the British public in a time of great need for reassurance and hope. This evidence of commitment was never more important than after the German invasion of the Soviet Union during the summer of 1941. The bombing offensive constituted a second front, a significant source of relief to the beleaguered Soviets when no other offensive action was realistic or even possible. Later, bombing’s contributions would become a prerequisite to the successful invasion of northwest Europe, “an independent campaign to pave the way for a combined arms invasion of Hitler’s Europe.”45 From April until September 1944, the majority of Bomber Command’s activities were conducted in lockstep with the preparation, execution and aftermath of the invasion through Normandy. And in the wake of this effort, the command would deal decisive blows to the enemy’s
transportation and petroleum resources, effectively paralyzing the Third Reich in its final hours.

With respect to the charge that German war production actually increased after the start of the CBO, that is because a state of total war was declared only after the German defeat at Stalingrad in February 1943 and production then went to a frantic 24-and-7 mode from what had been, at Hitler’s direction, a relatively sedentary pace, since he was adamant that the military endeavours of the Reich
would not interfere with the consumer industries. And this vast acceleration of production was borne largely on the backs of millions of slave labourers dragooned into service from the occupied territories of the Reich. It is difficult to conceive of just what the Germans would have been able to accomplish had they not been forced into a very demanding industrial decentralization programme, had they not been forced to honour the bombing threats through so much bolstering of their homeland defences, had they maintained uninterrupted use and control of their production facilities, and had they maintained unimpeded use of their very diversified transportation networks.

The morality issue

As the late-war evidence of Nazi atrocities mounted, there developed a significant hardening of Allied sentiment to bring the German people so completely to their knees that they would never again contemplate bringing another holocaust down upon the world. This was reflected in the partial tactical use of strategic bombers during the push through Germany in the closing weeks. These actions served to reinforce the points that no citizen of the Third Reich was immune to or exempt from the bombing and that further armed resistance was futile. The deliberate demoralization of the enemy undoubtedly helped shatter the German will to resist, hastening the capitulation of German forces in the western urban centres and, thereby, saving many lives, both Allied and Axis.

The British had been the first of the two great Western democracies to engage the Axis forces, and they had been provided with many prior examples of indiscriminate area bombing by Germany, including Warsaw in 1939; Rotterdam, London and many other British cities in 1940; then Belgrade, Yugoslavia and additional British urban centres in 1941 and 1942. Area bombing was really the only viable offensive tool available to the British at the time, and it served due notice to friends and foes alike that Britain could, and would, fight back. It provided offensive relief to the Soviets when no other form of concentrated, sustained attack upon the enemy was yet possible. Further, substantial and repeated feedback from intelligence sources inside the Third Reich indicated that the bombing was scoring telling blows. Much of this rationale was still applicable after the United States entered the war. Further, the Americans were exerting pressure upon their British partners to conclude the European war as expeditiously as possible and then to turn their combined attentions against the Japanese. The Americans also learned—both through associations with the British and from their own combat experiences—that their own bombing forces were also, in reality, “blunt instruments of destruction,” with little true precision-bombing capabilities. This, in spite of the long-fostered, mythological public stance that they could deliver munitions precisely and effectively in all weather conditions.

Much of the present-day abhorrence of the wartime area-bombing strategy has been fuelled by the current propensity for viewing the campaign through the lens of today’s technological capabilities. While existing “smart” weapons can surgically demolish a specific room in a building without figuratively “rattling the china” in an adjacent room, such technology, taken for granted today, simply was not available during the Second World War.
Today, along with Randall Hansen, Margaret MacMillan and Robert Bothwell, there are others who continue to condemn the bombing. One of the most prominent recent examples is the British philosopher Anthony C. Grayling, who has implied a “moral equivalency” between the Allied strategic bombing campaign and the 9/11 (11 September 2001) attacks on the United States. Part of the problem, I believe, is a widespread current propensity to view historical decisions and the actions that resulted from them through the filtering lens of present-day sensitivities and technological capabilities. History can only be judged properly from within the context of the times during which it occurred. Hindsight invariably benefits from 20/20 clarity.

As to the frequently advanced argument, fatuous at best, that the Second World War was “Hitler’s war” and that 78 million Germans wanted no part of it, those attitudes were not much in evidence when Nazi legions were having their way with most of Eurasia during the first three years of the war. Nor is that argument of any consolation to the ghosts of the millions who were systematically exterminated in the death camps and elsewhere. Lost in much of the debate is the fact that Nazism was a thoroughly repulsive and evil force bent upon world domination. Public opinion surveys from the war confirm widespread support for the bombing. Neither politicians nor historians of the period challenged the policy extensively at the time. Further, there was very little questioning of the morality of the bombing during the war, and what little that did occur came primarily from isolated British religious leaders.

**The Legal Issue**

Although the Red Cross Convention on the Protection of Civilians in Wartime was agreed upon in Stockholm in August 1948, it was never formally ratified, and the matter has only been fully codified since 1977 in the wake of the Vietnam War, when the First Protocol to the Fourth Convention expressly forbade deliberate military attacks upon civilians. And it should be emphasized that this particular legislation was made possible largely by significant technological advances with respect to weapons delivery, which have, for the most part, rendered area bombing unnecessary.

**Closing Thoughts**

Bomber Command played an essential part as a guarantor of Allied victory during the Second World War. It provided an offensive tool that took the fight to the enemy when none other was available, and it gave the citizens of the Allied nations hope and pride while it did so. It provided Britain and the Dominions, through its very prosecution, a political dimension by which it could influence the conduct of the war. It demanded a significant diversion of German resources away from the Eastern Front, thereby aiding the USSR in its part of the combined struggle. It struck substantial and unrelenting blows against enemy morale. It threw Germany’s broader war strategy into disarray, forcing it to adopt a reactive rather than a proactive stance though industrial decentralization, which placed unsupportable burdens on a transportation network that was already stretched to the limit. It delivered crippling blows to the enemy’s sophisticated and diverse
transportation network, and it generated a loss of German air superiority, along with doing much significant damage to the Reich’s war industrial base. It eventually starved the nation of petroleum products, and it made the way safer for an Allied re-entry into northwest Europe in 1944. It effectively stymied German economic mobilization and technological development in many areas, and it goaded the Nazis into costly and ineffective retaliation campaigns, such as the V-1 and V-2 vengeance rocket programmes, at the expense of technologies with greater war-winning promise, such as the jet and rocket fighters and the Type XXI and XXIII U-Boats. Many military resources and personnel were diverted away from the fighting fronts just to honour the threats to the Reich, and massive amounts of manpower and material were needed to address the damage sustained by the bombing. While a great human price was paid for these accomplishments on both the combatant sides, in relative terms, the losses incurred to the Anglo-Americans were small when compared to those suffered elsewhere, such as in the USSR. And the overall cost was relatively low as a percentage of the total war effort, considering the gains that were realized. Wartime Bomber Command was a highly viable and effective fighting force, led with great dedication and purpose by a resolute and resourceful commander in Sir Arthur Travers Harris.

Dr. Peter Lee, a Portsmouth University Principal Lecturer in military leadership ethics, based at the Royal Air Force College Cranwell, and a former RAF chaplain summarized Sir Arthur Harris’s tenure at the helm of wartime Bomber Command as follows:

If Bomber Command reduced the length of the war by one day how many Jews were saved? What if Bomber Command reduced the length of the war by a week? By a month? Such a grotesque numbers game can never be accurately completed and it would seem perverse to even try. However, these numbers remind us that when great evil stalked Europe and Britain had to take the fight to its Nazi enemy, Harris more than anyone else was prepared to embrace a lesser evil in order to defeat it. He never shirked from his task, never denied it, never apologized and never regretted his actions. Harris had blood on his hands and never tried to hide it, and it was this that singled him out as a scapegoat. Churchill wanted his legacy and many in the country wanted to forget what they demanded of Harris in the darkest hours when fear and danger were overwhelming. It is time we remembered Harris’s role and moral culpability in its proper perspective and recall him from the wilderness.46

At this juncture, it is perhaps fitting that Harris’s biographer, Probert, should have the last words on the man and his command.

So what of his achievements and those of the Command he led? For over three years he directed its immense build-up and endeavoured ceaselessly to ensure its efficiency; he inspired not just the aircrew but also the hundreds of thousands in other roles whose tasks were essential to its support; he fought endless battles on their part at many different levels of command; and he did his utmost to publicise and explain their work. At the same time, while always subject to the frequent directives he received...
from above, he made virtually all the
key operational decisions. On top of
all this he gave unstinted help and
couragement to his United States
colleagues—and in the process helped
lay the foundations of the close ties
between the Royal Air Force and the
United States Air Force which have
been of such importance ever since.
True, there were disputes over
policies and methods, not surprisingly
with such a forceful, independently
minded Commander-in-Chief. So,
also not surprisingly, he had at times
to be overruled, but once the
arguments were over he obeyed his
orders, and most notably when
supporting the invasion operations
and earning the undying gratitude of
Eisenhower and his top-level
commanders. It was over Harris’s
primary role, the bombing of
Germany itself, that the main disputes
arose, particularly in the final months
of the war, yet while there will always
be debate over specific targets which
he selected at different times his total
achievements and those of his
Command are clear. They rightly
took the war to the enemy in the only
way possible in the earlier days, they
and their American comrades-in-arms
forced his air forces on to the
defensive, which was all-important
for the great sea and land campaigns
waged by the Allies; they caused
massive division of his resources of
all kinds; and they steadily wrecked
his economic structure. It was a
unique offensive carried out in a
unique war, and for his conduct of it
Sir Arthur Harris deserves to rank
among the great high commanders
of modern history.47

Lieutenant-Colonel David L. Bashow
(Retired) has written extensively in
books and select periodicals on a variety
of defence, foreign policy and military
history topics. His published books have
been well received by academics and
general readers alike, and most have
achieved best-seller status. In 2004, he
retired after 36 years of military service
as an Air Force fighter pilot, a senior
staff officer and a military academic.
His flying time includes nearly 2400
hours in the CF104/F-104G Starfighter,
and he is a graduate of the United States
Air Force / German Air Force Fighter
Weapons School and the United States
Navy’s Topgun at the postgraduate level.
In 2002, he was appointed an Officer
of the Order of Military Merit, and
he has also received the United States
Meritorious Service Medal. Dave has also
received commendations from both the
Canadian Forces and the United States
Air Force for saving aircraft in extreme
emergency situations. He is currently
Editor-in-Chief of the Canadian Military
Journal and an associate professor at the
Royal Military College of Canada. His
latest commercially available book is
titled No Prouder Place: Canadians
and the Bomber Command Experience
1939–1945, and it represents more than
five years of scholarship and research.
It has received outstanding reviews and
has already had a second printing. He
has also been extensively involved in
championing Canada’s Bomber Command
veterans in their struggles against the
Canadian War Museum and what they
believe was an unjust and inaccurate
portrayal of their contributions to
victory during the Second World
War. This has included publication of
several well-received opinion pieces
and articles in prestigious journals and
newspapers across the country and a
highly successful presentation to the Senate Sub-Committee for Veterans’ Affairs in July 2007 on the issue. Dave has subsequently had two additional books dealing with the Second World War bomber offensive published by the Canadian Defence Academy Press in Kingston.

### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AOC-in-C</td>
<td>Air Officer Commanding-in-Chief</td>
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<td>CBO</td>
<td>Combined Bomber Offensive</td>
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<td>PRO</td>
<td>Public Records Office</td>
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<tr>
<td>RAF</td>
<td>Royal Air Force</td>
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<tr>
<td>RLM</td>
<td>Reichsluftfahrtministerium (German Air Ministry)</td>
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<tr>
<td>SHAEF</td>
<td>Supreme Headquarters Allied Expeditionary Forces</td>
</tr>
<tr>
<td>USAAF</td>
<td>United States Army Air Force</td>
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<tr>
<td>USSTAF</td>
<td>United States Strategic and Tactical Air Force</td>
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### Notes


4. Ibid., 544.


11. Air Intelligence Result of Recent RAF Attacks Report to Prime Minister, 23 September 1942, in PRO Premier 3/11/12, 621.


15. Probert, 306.

16. Ibid., 292.


18. Sir Charles Portal, Memorandum for the British Chiefs of Staff, 3 November 1942, in PRO Air 14/739A.


22. Gee was the code name given to a radio navigation system used by the RAF during WWII. Originally designed as a short-range blind landing system to improve safety during night operations, it developed into a long-range general navigation system. “Gee (navigation),” Wikipedia, accessed November 4, 2013, http://en.wikipedia.org/wiki/GEE_(navigation). Officially the AMES Type 100, the Gee-H was a radio navigation system developed during World War II to aid Bomber Command. “Gee-H (navigation),” Wikipedia, accessed November 4, 2013, http://en.wikipedia.org/wiki/Gee-H_(navigation).


25. The American development of the British H2S radar. It was used by


28. For a more detailed discussion of the Dresden raids, including the justification, the results and recently revised civilian casualty estimates, see David L. Bashow, *None but the Brave: The Essential Contributions of RAF Bomber Command to Allied Victory during the Second World War* (Kingston, ON: Canadian Defence Academy Press, 2009), 151–53 and Chapter 3 Notes 85–88.


30. Neillands, 373.

31. Ibid., 372.


33. Ibid., 61.

34. Note to Prime Minister (Top Secret, undated) by Sir Charles Portal, at PRO Premier 3/12, 18–21.


37. Transcribed by author during a visit to the Hiroshima Peace Museum, Hiroshima, Japan, 15 July 2002. The War Cabinet, apparently figuratively, was calling for the sacrifice of every Japanese man, woman and child, if necessary, to repel the invaders from the west, since the total population of Japan, as late as April 1947, was just over 73 million.


39. Giangreco, 110, Note 38. A third atomic weapon was going to be available by mid-August, and 8 or 9 of them were to be available for planned battlefield tactical use during the invasion of Kyushu in November, along with the planned use of poison gas. Ibid., 201–2.

41. D’Olier and others, 71.

42. For a detailed discussion, see Bashow, *None but the Brave*, 144–47.


44. Neillands, 301.


47. Probert, 414.