The History of the Twentieth Century
Episode 399
"War in the Air I"
Transcript

[music: Fanfare]

"It should be emphasized that the destruction of houses, public utilities, transport and lives, the creation of a refugee problem on an unprecedented scale, and the breakdown of morale both at home and at the battle fronts by fear of extended and intensified bombing, are accepted and intended aims of our bombing policy. They are not by-products of attempts to hit factories."

Air Chief Marshal Arthur "Bomber" Harris.

Welcome to *The History of the Twentieth Century.*

[music: Opening War Theme]

Episode 399. War in the Air I.

Back in episode 355, I described to you the RAF bombing campaign against Germany in 1942. In a nutshell, the British began retaliatory bombing of German cities after the Luftwaffe began targeting British cities in the latter half of 1940. Early British bombing raids produced few results and cost many planes and air crews, but over the course of 1941, RAF Bomber Command learned the same lessons the Luftwaffe had learned in 1940: that the most effective way to use bombers was in area attacks against cities at night.

A bombing strategy like that used to be called a war crime, but the British told themselves they were avenging the German bombing of Britain. British bombing attacks were meant to destroy factories when possible, but mostly the worker housing around them, in order to disrupt German production and lower German morale, on the principle that nothing lowers a civilian's morale more than destroying their home and everything in it.

Naturally, when you bomb houses at night, it is highly probable that the families that live in those houses will be in them at the time, but this was dismissed as an unfortunate happenstance. The RAF wasn't *targeting* civilians. They just happened to be there during the bombing raid, and that made all the difference.

In 1942, Bomber Command organized huge air raids, sometimes involving more than a thousand planes. These attacks were not always successful, but when they were, they could be quite devastating. The RAF also benefited from a new generation of bomber, especially the Avro Lancaster, a heavy bomber with a longer range and a greater payload than anything else in the air.

What about the Americans? The US entered the war in December 1941. In episode 355 I briefly mentioned that the US began shipping heavy bombers to Britain in 1942. Today, I want to talk about the American effort to build a bomber force in Britain and the Combined Bomber Offensive that the RAF and the US Army Air Forces together conducted over Europe in 1943.

The story of the American bombing campaign in Europe begins on January 19, 1942, with the establishment of the Eighth Air Force, which consisted of VIII Bomber Command and VIII Fighter Command. Here we see immediately one of the differences between the British and American air forces. The British Bomber Command was bombers. If you wanted fighter planes, you'd look to Fighter Command. The Americans integrated fighter escorts into their Air Forces.

Initially, Eighth Air Force's role was seen as supporting an invasion of Europe, since, as you know, at this point in the war, the Americans were talking about invading continental Europe before the end of 1942.

Eighth Air Force headquarters was soon set up near High Wycombe in Buckinghamshire, where was located the headquarters of RAF Bomber Command. The Americans made it clear from the beginning that US air forces would not be placed under RAF command, although they did acknowledge they would have a lot to learn from the more experienced British.

It took until August before the Eighth Air Force began its first regular mission. The target was a marshalling yard outside Rouen, in France. In case you didn't know, a marshalling yard is a railway yard where one track splits into as many as ten or more. Such a yard is used to sort railway cars by destination so they can be assembled into trains. An individual car might be sorted, or shunted, as they say, several times between its origin and its ultimate destination. A marshalling yard is a tempting target. It's big, so it's hard to miss. I should say not quite as easy to miss. You'll recall from episode 355 that getting bombs anywhere near their targets was proving embarrassingly difficult for Bomber Command.

And also, Rouen is near the Channel coast of France, so it was pretty close to England and it would be possible to provide escort for the B-17s that went on this mission. The mission commander was the 27-year-old Captain Paul Tibbets. I have a hunch we'll be hearing that name again before the war is over.

Publicly, the British and the Americans were the best of friends. Privately, the head of RAF Bomber Command, Air Chief Marshal Arthur Harris, complained endlessly about the Americans. By late 1942, they'd been in the war for going on a year, yet they were still "building

up" their bomber force in Britain and had little to show for their efforts so far. The Eighth Air Force had taken over airfields in East Anglia, forcing RAF bombers to operate from bases farther west and north, which meant longer ranges, longer flying times, and therefore greater risk to RAF flyers, yet despite occupying the choicest airfields, the American contribution to the bombing campaign so far was trivial.

Harris was testy with the Canadians, too. The Royal Canadian Air Force insisted on operating separate all-Canadian planes and squadrons, yet Harris was expected to give them British planes. He didn't like that very much.

Canada was the only Allied country with a contingent of aircrew serving in the RAF large enough to justify separate bomber units—the Canadians even had an all-Fracophone bomber squadron—but RAF Bomber Command also included aircrews from Australia, New Zealand, Poland, France, Norway, the Netherlands, and Czechoslovakia.

With regard to his complaints against the Americans, Harris perhaps failed to consider that it had taken Bomber Command more than two years to develop into the force it was at the end of 1942. The Americans had had barely a year, and they suffered from the disadvantage of having to ship everything the Eighth Air Force needed—planes, crews, mechanics, tools, equipment, gasoline, spare parts—across an ocean infested with U-boats before any of it could be put into action. You also have to consider that once the Americans agreed to Operation Torch, many American air units had to be diverted to North Africa to support operations there.

If Harris seems a bit testy just now, you have to understand that he was also taking on a torrent of criticism that his bombing campaign was a costly effort that produced little. Despite improved tactics, at the end of 1942, British bombers were lucky to land one-third of their bombs within three miles of their target, and that number dropped precipitously when the weather was foul.

Bomber Command put together some spectacular bombing raids in the first half of 1942, which I already told you about, but it could not maintain that pace for the rest of the year. The RAF dropped 37,000 tons of bombs on Germany in 1942, a 60% increase over 1941, which sounds pretty good, but it came at a cost of more than 2,700 British bombers shot down in combat or lost to accidents. British bombing raids killed about 4,900 Germans in 1942. That's a ratio of less than two people killed per bomber lost. Postwar studies suggest that the bombing campaign diminished German war production by about 2.5%. That's half of the damage done to British war production by the Luftwaffe in 1940. In spite of the bombing losses, German war production in 1942 was up more than 50% compared to 1941.

Some in the British government were questioning the value of the bombing campaign. Winston Churchill responded to the questions by declaring that the campaign was "better than doing nothing." I think they call that "damning with faint praise."

No doubt he was considering the political dimension as well. The bombing campaign over Germany was highly publicized, with photographs of bombed German cities appearing in the newspapers. The bombing campaign was one of Churchill's answers to Stalin's complaints that the Western Allies weren't doing enough to defeat the Nazi menace. Imagine how a suspension of the campaign would be received by Stalin, or by the British public.

In fact, there was one indisputable way the bombing campaign was assisting the war effort. It forced the German military to deploy hundreds of fighter planes and thousands of anti-aircraft guns that it could have put to use on the Eastern Front or in North Africa. So there was that.

Arthur Harris firmly believed that Bomber Command had found the ideal strategy. Area bombings of factories and working class housing at night was going to win the war, as far as he was concerned. With the coming of 1943 and new heavy bombers, Harris confidently declared that the combination of Soviet military pressure in the East plus the bombing campaign in the West would force an end to the war by 1944, without, mind you, any need for an invasion of Western Europe. Operation Overlord would be rendered redundant.

There is a certain Underpants Gnome quality to Harris's thinking. Step One is bomb Germany heavily and Step Three is Germany collapses, but the intermediate step is missing; the one that explains how we get from Step One to Step Three.

Harris may have been thinking about the end of the last war. Remember that in 1918, Germany's final collapse came as a result of a revolution that began in the Navy and spread across the country. It was a mass rejection of the Imperial government's policy of continuing the war at any cost by a public that was fed up with the sacrifices they were forced to make.

It would be only natural to look to the example of the last war when thinking about how this one might end, but Harris's view overlooks a more recent example: the German bombing of Britain in 1940. When the Luftwaffe turned to bombing British cities in August of that year, they had exactly the same idea, that aerial bombing would cause so much suffering among the civilian population that they would force British capitulation. In fact, the opposite had happened; the British public became more united and more supportive of the war effort.

This was pointed out to Harris and to Bomber Command at the time, notably by the Americans. The response from people like Harris was that the British and the Germans were different. British people were tougher, more dedicated, and more willing to accept privation for the sake of victory. The Germans were not, as indeed their collapse in 1918 demonstrates.

The Americans had a wholly different view of how to conduct strategic bombing. They wanted to fly in daylight, for starters. The RAF had given up on daylight bombing raids. Bombing accuracy is better in daylight, assuming good weather, but enemy fighters and anti-aircraft guns are more accurate in daylight too, and the British had lost too many planes that way before committing to nighttime raids.

To counter this problem, American bombers were built to fly at very high altitudes, as high as 11 kilometers or seven miles, and above the reach of anti-aircraft cannons like the dreaded German 88s. Even fighter planes would struggle to reach that altitude, and the ones that could would need about seven minutes to get there, by which time the bombers would be more than 30 kilometers away.

And American bombers flew in close formation (which is much safer in daylight) and were armed with machine guns, so any fighter that did get close would find itself targeted by multiple guns firing from several bombers. The B-17 so bristled with machine guns that in 1935 a newspaper reporter dubbed it a "flying fortress," and the name stuck.

Wait a minute. 1935? Yes, the first B-17 bomber, designed by Boeing, was built in 1935 and the plane entered service in 1937. The Americans also flew the Consolidated B-24 Liberator, a newer bomber that could carry a greater payload and flew a little bit faster than the B-17. It had a great range too, which you'll recall was why it was in demand as a submarine hunter. But it didn't have the B-17s high ceiling and was vulnerable to anti-aircraft fire from the ground. It wasn't as tough as a B-17 either; it was easier to shoot down.

High altitude would also decrease bombing accuracy, but the Americans had the famous Norden bombsight, which—allegedly—could deliver bombs with precision from miles in the air.

Arthur Harris, on the other hand, believed that precision bombing was so much stuff and nonsense. His bombing strategy was the only one that would work, and anyone who advocated for a change was only prolonging the war. He had a name for them, the advocates of precision bombing: "panacea target mongers," by which he meant people peddling the idea that precision bombing of some particularly vulnerable German target would prove all that was needed to cripple the German war effort.

And this brings us to the Casablanca conference. I dedicated episode 383 to the Casablanca conference, and there I mentioned briefly that the British and Americans agreed to a combined bomber offensive against Germany, the Americans to bomb by day and the British to bomb the same cities by night. Round the clock bombing would give the Germans no respite and would have to be devastating to civilian morale, right?

What we actually see at the Casablanca conference is one further example of the Anglo-American alliance putting forward a public declaration of a joint effort by two allies in complete agreement to paper over some very serious disagreements being hashed out in private by senior commanders of the two nations' militaries. This is not the first time we've seen this, and it won't be the last.

Churchill was particularly alarmed about the American insistence on daylight bombing. He believed that the Americans were setting themselves up for disastrous losses and spent the last weeks of 1942 lobbying Roosevelt and Eisenhower for a switch to night bombing. The

Americans were unmoved and eventually Churchill's air minister, Sir Archbald Sinclair, warned him that if he pressed the matter too far, the Americans might decide to move their bombers to the Pacific. At Casablanca, the Americans secured an agreement that neither air force would be permitted to dictate procedures or tactics to the other.

The Americans were worried that the British might want to nominate Arthur Harris, the grumpy, stubborn, opinionated head of RAF Bomber Command as overall commander of the combined offensive, but instead the two allies reached a compromise both were happy with. The overall commander would be a Briton—Sir Charles Portal, the chief of the whole RAF—but he was a Briton the Americans were comfortable with.

Regardless, the decision that the Americans would bomb by day and the British by night required that the two air forces maintain entirely separate organizations, and Portal would not have operational authority over either of them. His role would be to coordinate the two forces, but it was left unclear exactly what that meant or what the extent of his authority truly was.

This new arrangement made little difference to RAF Bomber Command, and Arthur Harris intended to continue into 1943 the same strategy he'd devised in 1942. So far, according to Harris, Bomber Command had devastated the city of Essen, in the industrial Ruhr valley, while five other German cities, including Berlin, had been, in his words, "badly knocked about." His plan for 1943 was to "Essenise" (his word) one German city every month and "knock about" three others.

The Americans found this approach puzzling. In a meeting at the Air Ministry in March, the American representative asked what precisely was Bomber Command attempting to do? Was it to kill as many German civilians as possible? Was it to force Germany to expend resources to defend and rebuild the targeted cities? Or was the goal to destroy specific sites of military or economic significance? The question was greeted with an awkward silence.

[music: Traditional, "British Grenadiers."]

If British strategy was vague, the Americans offered one heavily specific. The Americans viewed the main purpose of the bombing campaign to be weakening the German military as much as possible before next year's Operation Overlord. To achieve this, the top priority would be to deplete German fighter strength by bombing airfields and repair facilities. (You may recall that was how the Germans began their bombing campaign over Britain in 1940.) Beyond that, the top targets would be German aircraft factories and the shipyards where the Germans built their U-boats. Beyond that, also petroleum, which was obviously the German Achilles' heel, particularly those Romanian oil fields that Adolf Hitler has been fretting about for at least two years. Now his nightmare was about to become reality.

Also high on the target list were facilities that produced ball bearings. Now, that might sound a little strange, but ball bearings were important in the construction of aircraft, tanks, and other

vehicles, and Allied analysts had determined that since there were only a few factories in Germany that produced this vital product, erasing German ball bearing production might be the quickest and easiest way to cripple the German military.

Speaking of airfields, as all three Allied countries: the UK, the US, and Canada, built up their bomber forces in Britain, British airfields were getting scarce. Heavy bombers require longer runways than lighter planes; they also require extensive storage space for bombs and fuel and spare parts. One of the ways the Allies dealt with this problem was by moving all their aircrew training programs to North America. In December 1939, the British and Canadian governments agreed to a plan for joint air training in Canada, where flight schools were set up to train British, Canadian, Australian, and New Zealander aircrews. In 1941, even before the US entered the war, America began admitting flyers from Allied nations into US Army air training schools.

The Allied 1943 bombing offensive against Germany only began in earnest in March, with RAF Bomber Command again attacking Essen and other cities in the industrial Ruhr valley. This was nothing new for Bomber Command of course, but the industry in the Ruhr valley was too juicy a target to ignore. It was Germany's heaviest concentration of factories and industrial sites and it was in western Germany and thus easier for the RAF to reach.

As you'd expect, the Germans were fully cognizant of the RAF's interest in the region, so here is where Germany's air defenses were strongest. Over the previous two years, the Luftwaffe had developed a static line of air defenses that ran from Denmark south and west into France. Any bombing raid originating in Britain would thus have to cross this line in order to bomb targets in Germany. The RAF called it the Kammhuber Line, after the Luftwaffe general who commanded it.

The Kammhuber Line consisted of a string of rectangular zones, or boxes, twenty kilometers wide. Each box contained a radar station, searchlights, anti-aircraft guns, and several day and night fighter planes. When the radar detected an approaching bomber, a fighter would take off and the radar station would direct it toward its target. Since the RAF usually bombed at night, the radar station would also direct the searchlights toward the bomber to illuminate it so the fighter pilot could see it.

The Germans built up the line over time. By 1943, the Luftwaffe had some 500 day fighters, usually Me-109s or the newer FW-190, and 400 night fighters, typically Me-110s, so that each box had three fighters available day or night to attack incoming planes.

The easiest way for the RAF to defeat the Kammhuber Line was to send large numbers of bombers in a mass formation right down the middle of one of the boxes, which would overwhelm the defenders. Kammhuber requested thousands of additional fighter planes to reinforce his line, but the Luftwaffe simply didn't have them.

Bomber Command had attacked the Ruhr region before, but from March to June 1943, Bomber Command attacked the Ruhr region like never before. The Krupp works in Essen was put out of action for a time and manufacturing operations in the region had to be dispersed. The Ruhr was a major steel production region; Bomber Command forced a reduction of something like 15% of steel production across Germany. The attacks created shortages of replacement parts that were felt across the German military. Bomber Command lost hundreds of bombers and thousands of aircrew; the risk that a given bomber would be shot down on a given raid was around 5%.

The US Eighth Air Force, by contrast, could only "nibble at the fringes" of German war production, as one of its officers put it. Its first daylight raids resulted in losses to the force that were in the range of 10-15% of its already limited numbers of bombers. Over the first half of 1943, Bomber Command dropped 63,000 tons of bombs on Germany; the Eighth Air Force 8,400.

The first time the Eighth Air Force and Bomber Command conducted a joint bombing campaign on a German city was in the final week of July, 1943. The codename for this attack was Operation Gomorrah. The name refers to the Canaanite city of Gomorrah, which was destroyed when God rained fire and brimstone down upon it; the story is recorded in the 19th chapter of the Book of Genesis. The German city chosen to share Gomorrah's fate was Hamburg.

Hamburg was and is the second most populous city in Germany, after Berlin. It was also home to a number of industrial facilities that supplied the German war effort, including an aircraft engine factory, oil refineries, and shipyards that built U-boats. It was geographically close to Great Britain, making it an easier and safer target, and its location, on the lower Elbe River, not far from the North Sea, made it easy for bombers to find. Just fly up that really wide river and there it is.

With all these features making Hamburg such a tempting target, you might wonder why the city had not yet been the target of a major bombing raid. There are a few reasons for this, among them simple luck. In 1942, when Arthur Harris was putting together his thousand-bomber raids, he had considered Hamburg as a target, but bad weather always forced Bomber Command to raid elsewhere.

The British had in fact been contemplating a big raid on Hamburg for two years. Back in 1941, the RAF identified Hamburg as the German city most vulnerable to an incendiary raid, owing to its large neighborhoods packed with high-density working-class housing, some of which dated to the Middle Ages.

I already described to you in episode 355 how the British developed a bombing strategy based on dropping a few large high-explosive bombs, known as "blockbusters," to blow out windows and doors, then large numbers of small incendiary bombs to start fires in buildings that were now thoroughly ventilated, so to speak. The British built mock-ups of typical urban German homes in order to test and perfect their bombing techniques. In this work they received assistance from

German refugees with knowledge of German construction practices, including architect Walter Gropius, founder of the Bauhaus School, whom we met in episodes 50, 241, and 266.

And the RAF began the practice of dropping a third type of bomb after the blockbusters and the incendiaries. These were smaller anti-personnel bombs designed to explode after a delay, in order to kill or wound firefighters and other emergency workers arriving to rescue bombing victims or put out fires.

By 1943, after years of practice, the RAF had perfected its techniques for setting fire to densely populated neighborhoods of German cities. The Americans were quite impressed and studied their work.

The choice of Hamburg as a target was not without its controversies. The British government's most important science advisor, Henry Tizard, was vocally opposed to bombing Hamburg. Hamburg had a large working-class population that had supported the SPD and the KPD, back when Germany had real elections and the leftist parties were permitted to exist. Hamburg was where the German Revolution of 1918 had started. It was a city full of people inclined to be hostile to the Nazis and to support the Allies. Bombing them would only drive them into Hitler's arms.

The RAF responded that Hamburg was simply too large a target with too many sites of military significance for Bomber Command to ignore.

The bombing raid on Hamburg was in fact a series of raids over a ten-day period, from July 24 to August 3, 1943. The first raid, on the night of the 24th, involved more than 700 British planes and dropped 2,200 tons of bombs on the city. That works out to about 4.5 coventries. Most of the bombs missed the targeted center of the city, but Hamburg is a big city and even those bombs hit residential neighborhoods. The death toll from this one attack ran in excess of 10,000 people, three times more deaths than any other British bombing raid so far.

Over the following two days, the American Eighth Air Force sent daytime raids over Hamburg and Hannover, targeting specific industrial sites. The Americans lost 37 planes in those two days, a loss rate of more than 10%, demonstrating that the British had a point about the dangers of daytime raids.

It had rained in Hamburg on July 22, but the following week saw unusually dry weather with temperatures in excess of 30° C and low humidity. On the abnormally hot evening of July 27, another RAF raid, again numbering in excess of 700 planes, dropped 2,300 tons of incendiaries on the densest residential neighborhoods of the city. Within an hour, two square miles of the city were in flames. The previous raid had damaged much firefighting equipment and the water system was damaged. Fire fighters and emergency workers were overwhelmed as the numerous fires merged together to create a titanic firestorm, a "hurricane of fire," as the city's police chief later described it.

The heat of the inferno created a fountain of hot air rushing up from the city. The vacuum it left behind was filled by intense winds blowing into the city from all directions with hurricane force. In inrushing air acted like a natural bellows, feeding the flames and intensifying the heat. The fire reached temperatures in excess of 800° C, enough to consume everything but brick and stone. The greedy flames sucked up all the oxygen, suffocating those hiding in underground shelters.

This was not the end of Operation Gomorrah. Two more large raids came, dropping even higher numbers of bombs on the city, though there were no further firestorms. Too much of the city had already been consumed to allow for that.

In fact, though the attack on Hamburg was unquestionably devastating, studies of the effect it had on the city's war production showed it had far less effect than you'd imagine. The shipyards were undamaged. The city's port facilities were operating at 75% capacity within a month after the attack, and by the end of 1943, production of war materiel was at 80% of levels before the raid.

But, as "Bomber" Harris argued, these raids were not really intended as a blow to the German economy. They were to cause large-scale civilian deaths, and "de-house" large numbers of the survivors. By that measure, mission accomplished. The raid destroyed 214,000 homes, more than half the city's housing stock. German officials recorded nearly 16,000 deaths based on the identification of individual bodies, but a greater number of victims didn't leave behind enough to identify them. The numbers who died in bomb shelters were in some cases estimated based on the amount of ash left behind.

Overall, it is believed the bombing raids on Hamburg collectively killed between 35,000 and 40,000 German civilians, the highest death toll of any bombing raid in the European Theater, although in Japan…well, that's a topic for another episode.

We'll have to stop there for today. I thank you for listening and I'd like to thank Eduardo for his kind donation, and thank you to Michele for becoming a patron of the podcast. Donors and patrons like Eduardo and Michele help cover the costs of making this show, which in turn keeps the podcast available free for everyone always, so my thanks to them and to all of you who have pitched in and helped out. If you'd like to become a patron or make a donation, you are most welcome; just visit the website, historyofthetwentiethcentury.com and click on the PayPal or Patreon buttons.

As always, the podcast website also contains notes about the music used on the podcast. Sometimes it's my own work, sometimes it's licensed, but many times, the music you hear here is free and downloadable. If you hear a piece of music on the podcast and you would like to know more about it, including the composer, the performers, and a link to where you can download it, that would be the place to go. While you're there, you can leave a comment and let me know what you thought about today's show.

I am happy to report that my son continues to do well, and I'm going to try to release the next episode in one week's time, rather than two, partly because it's going to be a continuation of what we've been discussing today. I don't know that I'm ready to go back to the normal schedule yet, but I'll try two weeks on and one week off and see how that goes. So I hope you'll join me next week, here, on *The History of the Twentieth Century*, as we continue to look at the air war in 1943. We'll look at the German reaction to the bombing of Hamburg and we'll see how well the Americans do with their campaign to destroy Germany's ability to make ball bearings, which is exactly the sort of thing "Bomber" Harris was deriding when he spoke of "panacea targets." War in the Air II, next week, here, on The History of the Twentieth Century.

Oh, and one more thing. Another controversy that emerged during the planning of Operation Gomorrah was the proposed use of Window, a secret British countermeasure meant to disrupt German radar. Window was in fact what we today call chaff: narrow strips of paper backed with aluminum foil and cut to one-half the wavelength of enemy radar. Chaff dropped from planes would produce false radar echoes that would obscure the radar signals of the real airplanes.

The British had developed Window some time ago, but had been afraid to try it. The first time it was used, the strips would be recovered by the Germans on the ground and they would know at once how it had been done. The Luftwaffe could potentially use the same trick to defeat British radar and open Britain to another round of bombing.

But by 1943, the Luftwaffe was spread thin and lacked the numbers of bombers to match what they had done in 1940, while the newest Allied higher-frequency radar systems carried aboard airplanes would be less vulnerable to chaff, so approval was given to use Window for the first time.

It worked great. German radar-guided searchlights moved randomly across the sky; German flak cannons and fighter planes could not locate their targets. When the chaff fell to the ground, German researchers knew exactly what they were; they had independently come up with the same idea a year earlier; in Germany, it was codenamed *Düppel*. The Germans had held off on using *Düppel* for the same reason the British had: fear of tipping off their enemy to their new invention.

[music: Closing War Theme]