

The History of the Twentieth Century

Episode 453

“The Panacea Target”

Transcript

[music: Fanfare]

The story of the Allied bombing campaign over Germany has been one of tall promises and disappointing results, but in 1944, the Allies found the Germans’ key vulnerability: oil.

Welcome to *The History of the Twentieth Century*.

[music: Opening War Theme]

Episode 453. The Panacea Target.

I want to talk about the Allied aerial bombing campaign over Germany today, a topic we last considered in detail back in episode 400. My, this is a long war.

You may recall how I described the views of Air Chief Marshal Arthur Harris, known as “Bomber” Harris, the head of RAF Bomber Command. Harris had come to the conclusion that the best bombing strategy against Germany would consist of massive area bombings of major German cities, epitomized by the devastating 1943 bombing raids against Hamburg. He insisted that the war could be won simply by continuing to hit German cities with raids of that magnitude.

The Americans were not so sure. Area bombing was the inevitable strategy of an air force that practiced night bombing, as did RAF Bomber Command. Night bombing is by its nature unsuited to pinpoint attacks on specific targets, for the simple reason that you can’t see your target at night. No, the Americans had their own strategy, built around their B-17 bomber, the Flying Fortress. These bombers with multiple machine gun turrets were capable of defending themselves against enemy fighters, especially when they flew in large formations. This eliminated the need to hide in the darkness like the British. American bombers flew daylight missions, which made it feasible for them to target individual buildings or factories, rather than settle for British-style area bombing.

The Americans tried to suss out Germany’s economic vulnerabilities and launch pinpoint bombing raids against crucial war production. For example, in 1943, the Americans tried to

cripple German ball bearing production, on the theory that a ball bearing shortage would delay or suspend German production of motors, engines, and axles, crucial components of aircraft, tanks, and other vehicles vital to the German war effort.

Bomber Harris was dismissive of the American strategy of attacking what he liked to call “panacea targets,” as if this were, to put it in modern jargon, the “one weird trick” that would end the Second World War. Harris believed a big, brutal, bloody air campaign was the way to win the war. There were no shortcuts, no matter how badly everyone wanted to believe there were.

The Americans had their own argument against Bomber Harris’s strategy: wasn’t nighttime area bombing of cities exactly the strategy the Luftwaffe had settled on during the Battle of Britain in 1940? The Luftwaffe had at first conducted daylight raids at RAF facilities and aircraft manufacturing facilities in the hope of neutralizing the RAF. They never succeeded at that; RAF Fighter Command inflicted bomber losses in numbers so serious they forced the Luftwaffe to abandon daylight attacks in favor of night raids, which by their nature had to be area bombing.

RAF Bomber Command essentially recapitulated this story when its bomber losses on daylight raids in Germany forced a switch to night raids.

The Americans’ point was this: German area raids on British cities in 1940 succeeded neither in significantly reducing British civilian morale nor British war production. The Americans saw no reason to believe that German civilian morale or German war production would be any less resilient.

It took the Americans most of 1942 to build up a respectable bomber force in England; in 1943, they put their own theory of strategic bombing to the test, and the results were...unimpressive. There were successes, but there were also heavy losses.

German air defenses were too good. The Germans had plenty of fighter aircraft defending German airspace, including the Me 109 single-engine fighter, which had seen upgrades since 1940, along with the newer FW 190. Then there was the Me 110 two-engine fighter, also an improved version of its 1940 edition, which was slower, but a good night fighter, now equipped with rockets that allowed it to attack bombers while remaining outside the range of the bombers’ guns. And since 1940, the Germans had cut back on bomber production in order to produce more fighter aircraft to defend the Reich.

In early 1944, the Luftwaffe created the Reich Air Fleet, a centralized command that controlled air defense across Germany, not unlike the system RAF Fighter Command had developed during the Battle of Britain. From a command post in Berlin, the commander of the Reich Air Fleet traced the routes of incoming Allied bomber groups and could use any of 148 direct telephone lines to communicate with individual fighter groups and local command centers across Germany. And Allied bombers typically had to fly for hours over German-controlled territory to reach their targets, along predictable flight paths.

The Luftwaffe knew a great deal about Allied bombers and their capabilities, relying on study of crashed planes and interrogations of prisoners to collect information. The British invention of Window, what Americans called Chaff, gave the Allied bombing campaign a temporary edge, but by late 1943, newer and better German radar equipment could now tell the difference between bombers and the chaff they dropped.

With the number of daylight bombing raids on Germany steadily increasing as more and more American bombers arrived in Britain, the Germans responded by sharply increasing their production of light and heavy anti-aircraft guns, or flak guns, as they were known, and deploying them generously around the most important targets.

Finding gunners to operate the guns was a challenge, though. The Luftwaffe used pilots and other personnel who had been wounded and were no longer fit for front-line duty. Then they started recruiting volunteers from the Italian Social Republic and Soviet POWs. Then the Luftwaffe put out a call for teenage boys to volunteer. And, remarkably, given Nazi ideology, by early 1944 the Luftwaffe had over 100,000 women working on antiaircraft defense, although the Nazis felt compelled to put up propaganda posters that said, "The woman in a soldier's post is still a woman!" Just in case that was unclear.

The production of fighter aircraft, on the other hand, was a muddle. Flak guns, like most military production, was in the purview of Germany's talented Minister of Armaments, Albert Speer, but the Air Ministry controlled aircraft production. Under the Air Ministry, German fighter aircraft production doubled between 1942 and 1943, from 5,000 to 10,000, but while 10,000 planes per year sounds like a lot, German losses were also high and on net, the Reich Air Fleet was increasing its fighter strength by only 25 planes per month or thereabouts in late 1943.

In early 1944, the Air Ministry and the Armaments Ministry worked out a system for joint administration of fighter aircraft production. To speed things along, the number of different fighter aircraft variants was reduced from forty to five. The new, streamlined production system allowed Germany to manufacture nearly 25,000 fighter planes in 1944.

Increasing the number of planes was only one part of the solution. The new planes would need new pilots. Ramping up production of planes is one thing; how do you ramp up production of pilots? In 1942, Luftwaffe pilots got 50 hours of flight time before they were put into combat. By 1944, that number was down to 20 hours, because of the demand for new pilots ASAP and because of fuel shortages.

On the American side, awareness gradually grew that the strategy of relying on bombers to protect each other was not looking as good in the sky as it had on paper. If the Americans wanted to continue with their daylight raids, their bombers were going to need fighter escorts. As early as 1942, Army Air Forces commander Hap Arnold was requesting the development of fighters with drop tanks that could extend their range. In June 1943, unsatisfied with the record of the

Eighth Air Force, Arnold initiated a crash program with the goal of providing fighter escorts for every American bombing raid by 1944.

Early in the war, America's best long-range fighter was the single-seat, dual-engine Lockheed P-38 Lightning. That's the plane with the unique double fuselage. It had a range of 1,300 miles, which could be extended with drop tanks. The P-38 first entered service in 1942 in the Pacific Theater, where its long range made it useful for reconnaissance and in island-hopping campaigns.

In late 1943, the first P-38s were assigned escort duty with the Eighth Air Force. Their long range made it possible for them to fly from England almost as far as Berlin, but at first there were too few of them to make much of a difference. Also, after the planes were assigned to Europe, they proved to develop engine problems in cold weather, a problem not encountered in the tropical Pacific.

Until the first P-38s showed up, the main American fighter escort plane was the Republic P-47 Thunderbolt. The P-47 was a tough little plane that could take a lot of damage and, with its eight .50 caliber machine guns, it could dish out a lot of damage too. Its biggest problem was its limited range. Even with drop tanks, it could only fly as far as the western border of Germany. I already described to you how Luftwaffe fighter pilots learned to congregate in the air over western Germany when an American bomber raid was approaching and then wait for the P-47s to break off and head back to England before attacking the bombers.

The solution to this problem was the North American P-51 Mustang. The P-51 originated as a design created for the British by the US aircraft company North American Aviation. That story begins in 1940, when the British approached North American to inquire about manufacturing P-40 Warhawk fighters.

The Warhawk was designed and built by the Curtiss-Wright Corporation and in 1940, it was the most impressive fighter plane in the American arsenal. Unfortunately for the British, who were interested in acquiring some of them, this was when the Roosevelt Administration began building up American air power, so the US government was buying up every Warhawk Curtiss-Wright could produce.

The British government next approached North American with a proposal. They wanted North American to manufacture P-40s under a license from Curtiss-Wright. Well, a licensing deal would have required payment of royalties, which would mean less profit for North American. North American's president made the British a counterproposal: his company would design an all-new fighter plane superior to the P-40 and manufacture those for Britain.

In April 1940, North American presented the British with a design. In May, the British approved the design and ordered 320 of the new fighter, with the first of them to be delivered in January

1941. The first Mustang test flight took place in late October, 1940, just 149 days after the contract was signed, a remarkably quick production time.

The planes were delivered to the British in 1941 and the Mustang's performance was remarkable. The biggest drawback was the performance of its engine, which suffered significant power loss at high altitudes, where the strategic bombers liked to fly. In 1942, engineers at Britain's Rolls-Royce proposed refitting the American planes with Rolls-Royce Merlin engines, like the ones that powered the latest version of the Spitfire. It was tried, and it worked. The Merlin remained powerful at the higher altitudes. It was a marriage made in the heavens, so to speak.

Word of this breakthrough came back to the United States and reached Army Air Forces chief Hap Arnold, who placed an order with North American for 2,000 Mustangs fitted with Merlin engines to be manufactured in the United States under a license from Rolls-Royce. North American was already building Mustangs for Britain, but Arnold exercised his wartime authority to suspend the British contract in favor of production for the American military, an action that much irritated the RAF.

The first Mustangs joined the Eighth Air Force in England in December 1943. By early 1944, with higher-capacity drop tanks, the Mustang's range could take it all the way to Berlin or Vienna. When the first of these new American fighters crashed in Germany, Luftwaffe commander Hermann Göring tried to explain it away by suggesting the plane must have been blown far to the east by a windstorm.

I should point out here that one of the problems involved in sending fighter planes along to escort bombers is that light, single-engine fighters are designed for speed. Bombers aren't, and couldn't keep up with them. That meant the fighters had to fly zig-zag courses so they didn't get too far ahead of the bombers they were escorting. This tactic helped keep the bombers and fighters together, but at the price of the fighters consuming extra fuel and shortening their ranges even more.

Once Mustangs became available in greater numbers in 1944, the Eighth Air Force devised what you might call a "zone defense." P-47 Thunderbolts escorted the bombers on the first leg of their mission, as far as the German border, then turned back. But as they left, P-38 Lightnings would arrive and take over escort duties. When the Lightnings ran low on fuel and had to turn back, newly arriving P-51 Mustangs would take over to finish escorting the bombers to their targets and back again.

One of the advantages of this system was that the Lightnings and Thunderbolts didn't have to escort the bombers all the way, which meant they didn't have to fly in zig-zags all the way. They could take off some time after the bombers had already left and catch up to them at the rendezvous point, having spent less fuel along the way, which increased their range. Also, when fighter squadrons handed their bombers over to other escorts, the returning fighters were

encouraged to return to England not at the high altitudes bombers normally flew, but at lower altitudes, where they would be able to hunt for and attack any Luftwaffe fighters they encountered, perhaps taking off to attack American bombers or landing after an attack, or fighters caught on the ground at Luftwaffe airfields.

Still, in spite of the fact that this “zone defense” gave the older, shorter-range fighters a useful role in the bombing campaign, the superior characteristics of the Mustang were sufficiently attractive that as more and more Mustangs became available, the older escort fighters were phased out and transferred to other roles.

Hermann Göring is quoted as telling his American interrogators after the war that when he first saw Mustangs flying over Berlin, he knew the air war over Germany had been lost.

By early 1944, American fighters were establishing air superiority over German airspace on behalf of the bombers, and bomber losses dwindled. American Air Forces commander Carl Spaatz believed the table had now been set for a bombing campaign that would neutralize the Luftwaffe altogether and insure Allied control of the German skies.

His biggest obstacle was Dwight Eisenhower, who in early 1944 had plans of his own.

[music: Dvořák, *String Quartet No. 12 in F major*, “*American*.”]

Carl Spaatz began 1944 with a plan for nothing less than the elimination of Luftwaffe air defenses over Germany by the end of the year. With more and more P-51 Mustangs arriving in England, the future was looking bright.

The skies over Europe, on the other hand, were clouded over with rain and snow. It was winter, and the beginning of the campaign had to be postponed repeatedly until late February. On Sunday, February 20, the skies were clear and Operation Argument began. Argument was the first phase of the plan; it called for massive bombing raids on German aircraft and ball bearing production.

In 1943, the Germans had taken full advantage of the Americans’ lack of long-range fighter coverage to arm their interceptors with rockets and cannons, especially the two-engine Me 110, which was ideal for the heavier armaments. Heavier arms on an aircraft meant less maneuverability, but that meant very little when the enemy didn’t have any fighters of their own.

It was a satisfactory strategy that had worked well for the Germans, until Operation Argument. During the last week of February, the Eighth Air Force and the RAF made dozens of bombing raids on aircraft production facilities across Germany. The strategy here was a little more complex than it appears at first. The core idea was to put the Luftwaffe in a bind. If they sent interceptors after the bombers, they might disrupt the raid, but they’d pay for it in fighter losses. If they decided to hold the fighters back, they’d lose production capacity. Either way, it would mean fewer German warplanes during the next round of bombings.

During the first week of Operation Argument, the Allies lost some 28 fighter planes and 300 bombers, meaning over 2,000 aircrew killed or captured. But the Germans lost 260 fighters and a hundred pilots killed. Those figures comprise 35% of the Reich Air Fleet's planes and 20% of its pilots. In a week. The Americans ended the week with almost double the number of fighter planes they started the week with, owing to the large numbers of new P-51s arriving from the United States. A successful campaign overall, though alas the results were marred by a poorly executed bombing raid on the Dutch city of Nijmegen, which killed nearly 800 Dutch civilians.

There is also the damage done to German aircraft manufacturing, although that is more difficult to assess. Much German aircraft manufacturing had been moved to underground sites, and this week of attacks on the industry, which the Americans will later refer to as "the Big Week," hastened the effort to bombproof aircraft plants. After the war, Hermann Göring would gleefully point out to his interrogators that Allied bombing raids would have been more successful had they focused on aircraft engine production, as these plants were more difficult to relocate.

As for the RAF, "Bomber" Harris continued to believe his strategy of nighttime area bombing of German cities was the correct one. He resisted calls from the Americans to join in Operation Argument. He warned that any suspension of the RAF's city raids would allow the Germans the opportunity to recover and undo everything Bomber Command had accomplished so far. It took a direct order from his superior, Sir Charles Portal, to get Harris to cooperate with the Americans. But even then, Harris refused to switch the RAF over to daylight bombing, despite the Americans' argument that the RAF now had enough fighter aircraft to serve as escorts and no longer needed to fly by night.

RAF night bombing did little damage to aircraft factories because of the difficulties inherent to night bombing, as Harris warned, but even so, subjecting the sites to round-the-clock attacks did have the advantage of wearing down German anti-aircraft defenses.

What effect did this have on German aircraft production? Germany produced over 9,000 fighter planes in the first half of 1944, which was almost as many as the entire year 1943, and for this reason, some argue that Operation Argument was a failure. Still, German aircraft production for the period was substantially lower than what the Germans projected, and there were the fighter losses during Big Week, don't forget those.

The success of this operation boosted morale in the Eighth Army and Spaatz was persuaded to pursue the next phase of the plan, which was bombing attacks intended to kneecap German fuel production. Liquid fuels have always been Germany's Achilles' heel. Wow, that's really mixing the metaphors, isn't it?

Germany's lack of domestic petroleum resources was a serious problem in the last war, and helped bring down the Reich in 1918. But while Germany didn't have much oil, it had an abundance of coal. It also had the world's leading chemical industry, and between the wars, German chemists worked the problem of coal hydrogenation; that is, processing coal, which is

mostly carbon, into synthetic liquid fuels, which are hydrocarbons. The process was devised by a German chemist named Friedrich Bergius, and it won him a Nobel Prize in Chemistry in 1931.

By 1944, these synthetic fuel plants were crucial to the German war effort. And particularly the Luftwaffe's aviation fuel, three-quarters of which was now coming from the hydrogenation plants. These plants were huge, complex, and not easily relocated. Because of the quantities of fuel stored in them, they were also, in some sense, giant bombs just waiting to be detonated.

Spaatz wanted to begin a systematic campaign to deprive Germany of oil, both synthetic and the kind you pump out of the ground. But as you know, this is when Eisenhower and the Allied command wanted to begin the Transportation Plan, the bombing campaign meant to hamper the movement of German ground forces once the Normandy invasion began.

I already told you about this conflict in episode 431. Spaatz wanted to bomb German fuel production; Eisenhower wanted the Transportation Plan. Spaatz argued that depriving the Germans of fuel would do more to slow the response of German ground forces to the invasion than the Transportation Plan would, and in any case, high-altitude strategic bombers are not the ideal aircraft for bombing roads and bridges. Smaller tactical bombers that flew low to the ground would be more effective.

And as you know, Spaatz lost that argument, but there's a caveat. Eisenhower agreed to allow the Eighth Air Force to bomb those synthetic fuel plants on days when they weren't needed in France. In two raids during the month of May, American bombers put two German synthetic fuel plants out of commission. Enigma messages decrypted at Bletchley Park revealed the Luftwaffe was scrambling to increase the numbers of anti-aircraft guns at these plants, even transferring them away from aircraft factories. Better still, German fighters attacked these bomber raids in droves, giving American escorts plenty of opportunities to shoot them down.

The Luftwaffe quickly learned that its Me 110 heavy fighters, previously the preferred weapon to shoot down bombers, were sitting ducks for the lighter, faster, and more maneuverable American Mustangs. The Germans shifted to a tactic of arming the more agile FW 190 fighters to attack the bombers and sending Me 109 fighters to engage the American fighters.

This tactic didn't work for long. Before 1944, American fighter escorts were under orders to stay close to their bombers. There's an irony here, since back in 1940, the Luftwaffe was telling its fighter escorts the same thing during the Battle of Britain. The Germans learned that limiting the movements of the escorts was a bad idea and eventually gave the fighter pilots permission to leave the formation to hunt or chase enemy interceptors. The bomber crews objected, because they felt more secure looking out their windows and seeing their escorts close by, but experience showed that unleashing the fighters reduced bomber losses.

Unfortunately, the Americans repeated the German mistake and had to learn the same lesson all over again. In January 1944, James Doolittle, commander of the Eighth Air Force, gave his

fighter pilots permission to leave the formation at their discretion. Again, the bomber crews complained; again, the result was fewer bomber losses.

The month of April 1944 was the costliest of the war for the American Eighth Air Force. It lost 25% of its bombers in one month. The Reich Air Fleet lost 40% of its fighters. This is a pattern you should recognize by now during this war: the Americans could afford to take such losses, because there was a steady stream of replacement bombers and crews coming in from the United States, while the Germans struggled to maintain the Reich Air Fleet at 500 planes, and the quality of the replacement pilots was steadily declining. By this time, a German fighter pilot went up against the Americans with barely a 50/50 chance of returning. This had a serious effect on Luftwaffe morale, no surprise there.

As the danger to their fighters increased, the Luftwaffe responded with new instructions to its fighters: drive straight into the enemy formation. Focus on the bombers and disregard the fighters. This didn't do much to help either the German success rate or pilot morale. There are reported cases of German fighters deliberately ramming American bombers in desperation, although Adolf Hitler himself was strictly opposed to any suggestion that the Luftwaffe adopt Japanese-style *kamikaze* tactics, which the Japanese began to employ in October, 1944. I'll get to that in a future episode.

Luftwaffe losses mounted. In 1940, during the Battle of Britain, the worst month for the RAF was September. Fighter Command lost 25% of its planes. In 1944, the worst month for Germany was May. The Luftwaffe lost 50% of its planes.

You may recall that in 1943, even when American attacks on oil production succeeded, as in the case of the crucial Ploiesti oil fields in Romania, the bombers would knock out the refineries for a few weeks, but the Germans would then have them up and running again, so the benefit was limited.

The Americans learned from this experience as well. During the campaign against German oil sources, which yes, did also include oil wells and refineries, they followed up their bombing raids with reconnaissance flights that photographed and tracked the Germans' progress in repairing the facility. As soon as it was repaired, they would send another raid to put it out of commission again.

The Germans did manage to ramp up aircraft production, at least enough to keep up with losses. Fuel was another matter. Pilot quality was also another matter. Pilot quality declined in part because the German skies were not safe. On days when there were no bomber missions scheduled, the Eighth Air Force often sent squadrons of Mustangs to sweep German airspace and hunt for enemy fighters to attack. During 1944, Germany lost thousands of planes shot down en route from the factory to their assigned squadron.

Another reason for the decline in pilot quality was the sharp decline in fuel. The campaign to starve the Luftwaffe of fuel was working. By 1944, the Luftwaffe was getting most of its aviation fuel from the synthetic fuel plants. Production of aviation fuel in Germany was 175,000 tons in April 1944. This declined to 30,000 tons by July, and 5,000 tons in September. That's a 97% reduction.

This affected German ground forces, too. By late 1944, German Army mechanized and motorized units were literally running out of gas in the middle of battle. After the war, German Armaments Minister Albert Speer told his captors that the production problems caused by the Allied bombing campaign only became "insurmountable," his word, in autumn 1944.

Or to put it another way, the US Eighth Air Force had found the panacea target.

We'll have to stop there for today. I thank you for listening, and I'd like to thank Michael and Carson for their kind donations, and thank you to Vlad for becoming a patron of the podcast. Donors and patrons like Michael, Carson, and Vlad 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.

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And I hope you'll join me next week, here on *The History of the Twentieth Century*, as we consider the position of Germany's increasingly isolated allies. Romania switched sides; where did that leave Hungary, Finland, and Bulgaria? Find out next week, here, on *The History of the Twentieth Century*.

Oh, and one more thing. After the war, when the Allies interrogated Luftwaffe officers, they often blamed their leadership for their difficulties. And by leadership, they meant Hermann Göring. His subordinates found him volatile, unpredictable, peculiar, and often downright comical. Göring himself also passed the buck upward, telling his interrogators, "You had a great ally in your aerial warfare: the *Führer*."

That was probably unfair. After the failure of the Luftwaffe to relieve the Sixth Army at Stalingrad despite Göring's promises, Hitler became more deeply involved in the administration of Germany's air forces, but most of his decisions seem sound. For example, he supported moving the aircraft industry underground and the production switch from bombers to fighters.

For that matter, Göring's subordinate commanders did not exactly shine in 1944, though in fairness, most of these commanders had spent the war overseeing tactical and operational bombing attacks on the Eastern or Mediterranean fronts. As the Allied bombing campaign became more successful, and production switched over from bombers to fighters, Luftwaffe commanders had to operate in an unfamiliar environment—the skies over Germany—and in the unfamiliar role of air defense.

[music: Closing War Theme]