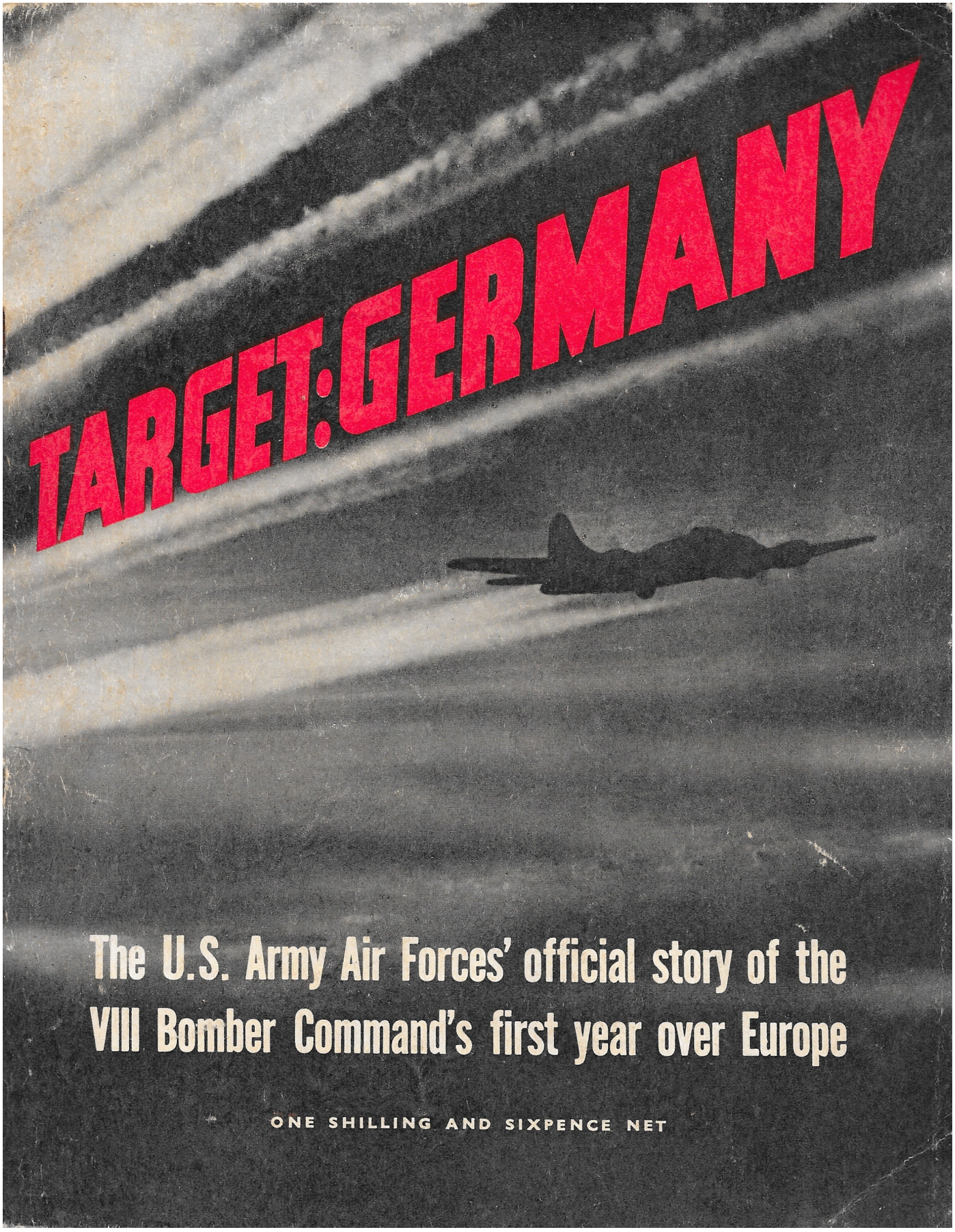


The U.S. Army Air Forces' official story of the VIII Bomber Command's first year over Europe

ONE SHILLING AND SIXPENCE NET

2 FROM FIVE MILES UP

Target: Germany is the story of an experiment. That the experiment is concerned with destroying the economic fabric of another nation is to be regretted. That it may be a large factor in saving our own way of life should not be forgotten. For aerial bombing is now beginning to return dividends which surpass the expectations of its stanchest adherents. Bombs alone do not win battles—but bombs behind the fighting fronts may rob armies of their vital supplies and make war so terrible that civilian populations will refuse to support the armed forces in the field.

During the past eight months scientific bombing has changed the face of war. For the physical attrition of warfare is no longer limited to the fighting forces. Heretofore the home front has remained relatively secure; armies fought, civil populations worked and waited. This conflict's early air attacks were the first portents of a changing order. In its slashes at Warsaw, Rotterdam, Plymouth, Coventry, and London, large-scale bombing showed its claws. The Germans had conceived a terrifying weapon. Fortunately, they had neither the imagination nor the physical resources to capitalize on their revolutionary conception.

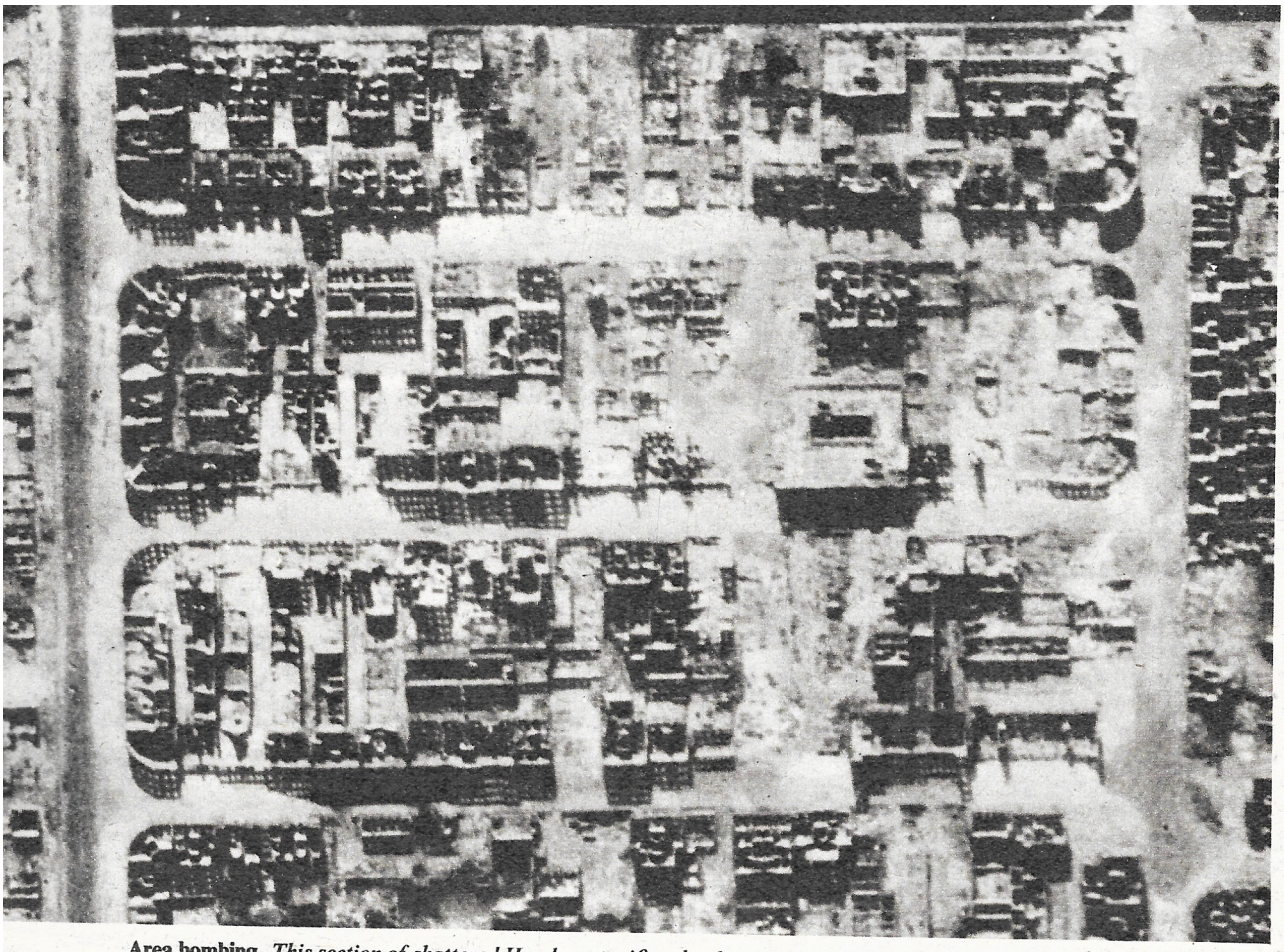
On the night of March 5-6, 1943, bombing came of age. On that date the RAF began the systematic, patterned devastation of the twelve cities of the German Ruhr. The ruins of the Ruhr, Cologne, and Hamburg, and the American-inflicted damage at the Hüls rubber plant, at the Heroya aluminum unit in Norway, and the Blohm & Voss shipyard at Kiel, have now clothed a German vision with reality. To borrow from Macbeth, it is the Nazis' own "Bloody instructions which, being taught, return to plague the inventor." The Ruhr, heart of Germany's heavy industry, has been crippled. In the first climactic four day-and-night Hamburg *Blitz* (the Germans even had a word for it), well over 2000 British and American aircraft dropped more than 7000 tons of high explosive and incendiaries on a city the size of Detroit. To quote an official report: "There is nothing in the world to which this concentrated devastation of Hamburg can be compared, for an inferno of this scale in a town of this size has never been experienced, hardly even imagined, before."

Hamburg Blitz. *High over the smoke of fires started by the RAF the night before, Fortresses strike at key targets from five miles up. Black flak bursts hang in the air. At lower right, Nazi fighters rise to challenge the American invaders.*

Here, then, we have terror and devastation carried to the core of a warring nation. The implications of such destruction of public morale and economy are not yet clear. They soon will be —perhaps before this book is published. It may be that, in forging so terrible a weapon, the United Nations have found the way to break any nation's will to fight. That would mean not only victory in this conflict but also the answer to any threats of war in the foreseeable future.

There are two kinds of bombing—strategic and tactical. Strategic bombing strikes at the economy of the enemy; it attempts to cripple its war potential by blows at industrial production, civilian morale, and communications. Tactical bombardment is immediate air support of movements of air, land, or sea forces. This record concerns itself only with strategic bombing.

There are, in turn, two kinds of strategic bombardment. *Area bombing* is directed at the industrial district or the city as a whole. This is the method perfected by the British Bomber Command in its night attacks. *Precision bombing* is directed at the specific industrial unit—the plant, the factory, or the railroad yards. This is day bombing on the American Plan. Neither force allows itself to be restricted by definition. The British Bomber Command occasionally employs precision bombing, though mostly at low altitudes; the daylight raids of its fast Lancasters on the M.A.N. Diesel-engine plant at Augsburg in central Germany, on the Ruhr dams, and on



Area bombing. *This section of shattered Hamburg typifies the devastation wrought by the British Bomber Command in its great night Blitz. The waffle-iron shadows are cast by gutted buildings.*

the Le Creusot steel plant in central France were classics of planning and daring execution. The American VIII Bomber Command edges into its neighbor's field of area bombing when unforeseen weather conditions close in on specific primary targets and general industrial areas are attacked as targets of opportunity.

These two types of bombing have so often been contrasted, usually to the disadvantage of one or the other, that it is not generally understood, outside of military circles, how the two complement each other. Day-precision and night-area bombing carried on simultaneously from the same bases, in this case the British Isles, results in a number of tactical advantages:

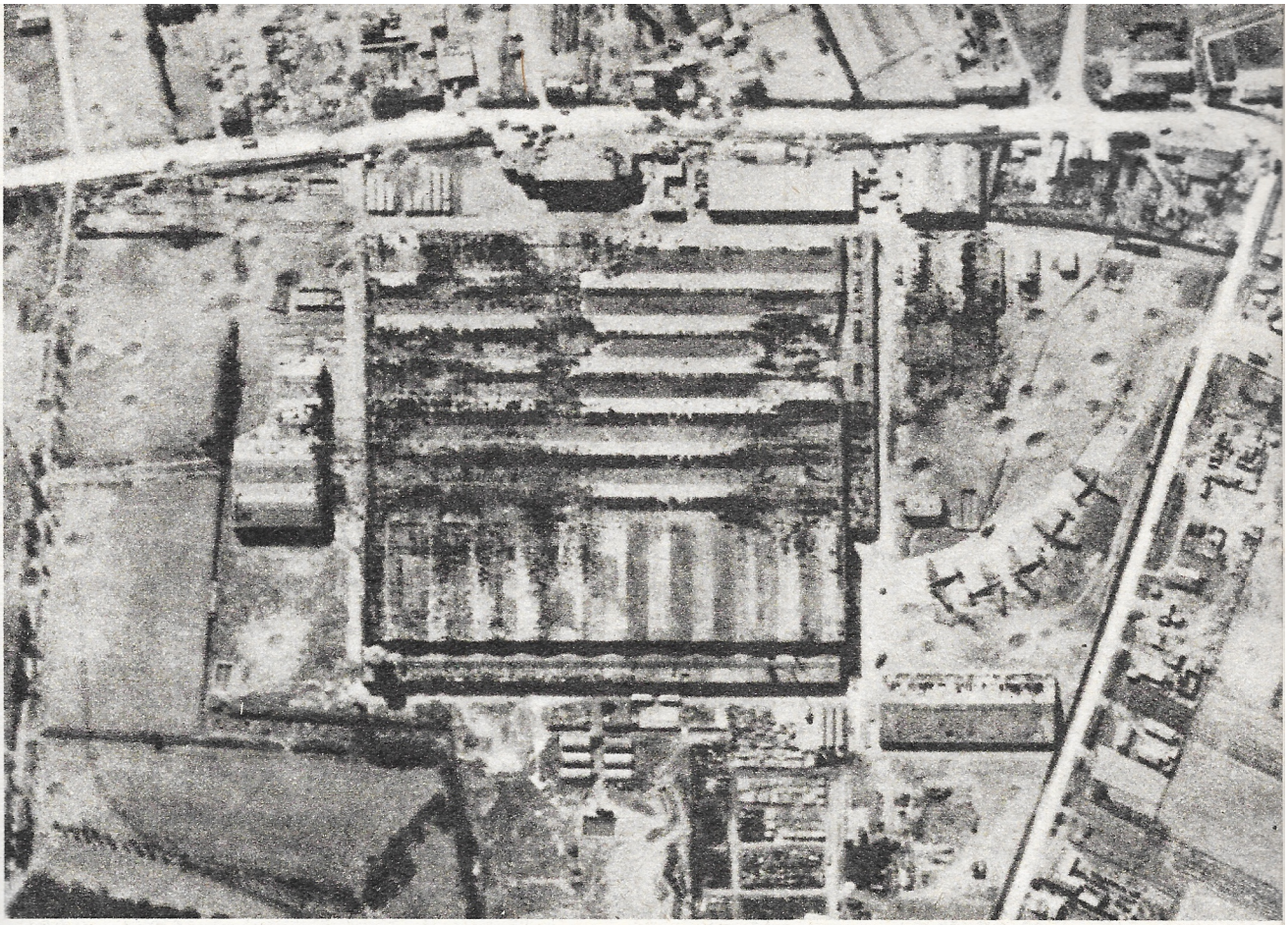
1. Our combined air attack against Germany can be spread over twenty-four hours a day. This means that their defenses must be alerted continuously and that their industrial work schedules are constantly being upset.

2. Both day and night fighter defenses must be maintained by the enemy. As these are independent commands using different types of planes, this results in a heavy drain on the German fighter strength on the active fronts.

3. Using part of our tremendous combined British-American bomber force by day and part by night simplifies the traffic problem over bases and the checking system in the coastal areas over which the planes pass on their way to and from enemy territory.

4. Area- and precision-bombing forces give the joint planning staff two specialized weapons. With the British force a city may be devastated but a specific plant may be missed. The American force, not yet carrying the weight of explosive necessary to wipe out the city, can go in and get the plant.

Day-precision and night-area bombing thus work ideally together. The two concepts, how-



Precision bombing. *This aircraft factory at Nantes, repairing German planes, was the target of American heavy bombers. The plant was wrecked. Note salvaged planes and bomb craters.*

ever, demand different equipment, different operational technique, and crew training systems that vary in many particulars. Area bombing at night is a highly complex art, demanding as much co-ordination, skill, and planning as precision bombing by day. As practised by the British Bomber Command, it requires a large force to saturate the enemy radio-location stations and night fighter defenses, and spread the damage over the largest area in the shortest possible time.

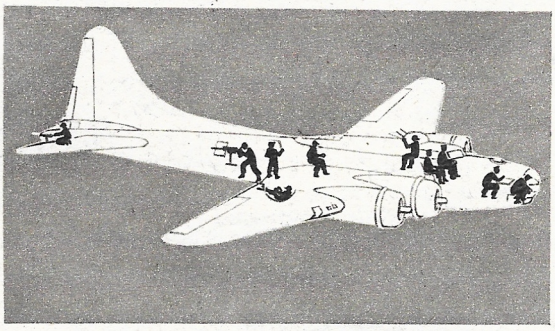
British bombers carry a large proportion of incendiaries; the value of starting hundreds of simultaneous fires in a city is obvious. A concentration of planes over the target also makes the job more difficult for the defending searchlights and antiaircraft batteries. The aircraft used—the Lancasters, Halifaxes, and Stirlings—are designed with load and range as primary considerations. The crews are trained for night operations, with special emphasis on accurate navigation by radio devices. The whole plan of operation is based on single-plane flights, each bomber navigating its own way to the target and arriving there at a given height, on a certain course, and at a scheduled time. "Pathfinders," especially trained in target identification, precede the main force and find and mark the target with flares.

High-level precision bombing demands, first, bomb-aiming equipment that insures accurate placing of the loads from high altitudes. It requires, also, planes with enough ceiling to avoid the most accurate heavy flak levels. German heavy flak (antiaircraft artillery fire) can reach above 40,000 feet, but its accuracy drops off fifty per cent every 5,000 feet above 15,000 feet, so the value of high-altitude operations is readily apparent. High-level precision bombing also calls for planes with the fire power

to ward off enemy fighters and for crews which work perfectly as a team in meeting and repulsing these attacks. Pilots and copilots must be extraordinarily skillful in flying heavily loaded planes in close formations at high altitudes, and the handling of the bomb sight must be of the highest order.

These are the basic differences, then, in the two strategic bombing techniques practised in the European Theater of Operations. The British turned to night-area bombing, after considerable early-war experience with both types of operations, because they felt the area technique better suited to their strategic capabilities. The Americans worked for years on the technique and the equipment for daylight precision bombing and then took the idea to war to try it out in actual combat. The difference in the way the two Bomber Commands were forced to approach the same problem should not be overlooked, as it accounts for many of the developments in the experiment described in the chapters to follow.

This American faith in the practicability of high-level, precision bombing in daylight began with a tactical problem, an airplane, and a bomb sight. The problem was that of defending American shores against attacking fleets. What was needed was a battleship of the air, and in 1935 the Boeing Aircraft Company designed and built one. This first Fortress cracked up and burned on a take-off during its trials, but the Army Air Corps had seen enough and thirteen were ordered. It took Boeing two years to produce these thirteen planes—at our present rate of production the thirteen could probably be turned out in a few hours at our heavy-bomber factories.



THE FORTRESS (B-17F)

Length	74 ft. 9 in.
Wing Span	103 ft. 10 in.
Height (Vertical Fin)	19 ft.
Weight (Gross)	(approx.) 60,000 lbs.
Bomb Load (Average)	5000 lbs.
Speed (Cruising)	211 m.p.h.
Horsepower	4800
Armament (.50-cal. Machine Guns)	12

These original experimental models, known as YB-17's, had 4,000 horsepower, a speed of 250 miles per hour, and carried five .30-caliber machine guns. The first production model, known as the B-17, came in 1937, and in 1938 the B-17A appeared. This plane, equipped with exhaust-driven turbosuperchargers, set a record of 259 miles per hour for 620 miles with a bomb load of 11,000 pounds. Several planes of this model were flown to South America and back.

The Army Air Force bombardment experts, meanwhile, had combined this new plane with a bomb sight developed during the early thirties. This sight (a piece of precision optical equipment with a computing device but without any of the magic qualities with which the Sunday-supplement writers invested it) was already in use in the Army's smaller bombers. Experiments were carried out at successively higher altitude levels. Each thousand-foot step, from 10,000 to 20,000 and then to 25,000 feet, introduced new problems.

Oxygen lack affected some men below 18,000 feet, all men above that. At 25,000 feet and above, this oxygen starvation can be fatal within a very few minutes. So oxygen masks were devised and a system gradually was developed for feeding the oxygen automatically. High altitudes and the consequent decrease in atmospheric pressure also accentuated many physical ailments and deficiencies unnoticed at lower altitudes—sinus trouble became unbearable, weak eardrums burst, and stomach disorders were aggravated. The intense cold at high altitudes resulted in many cases of frostbite, so electrically heated suits and gloves and boots were developed. The problem of what diet would best meet the discomfort of gas distension in the digestive tract was studied, as were the psychological effects of high-altitude fatigue. A whole new school of aviation medicine grew up to meet the demands of this new type of flying.

Meanwhile, the experimentation went on. The results were startling. From 20,000 feet above the dry bed of California's Muroc Lake, bombardiers found they could hit a 100-foot circle time and again. The Army's experts

weren't deceived by these early successes; they realized that the trials were being carried on with the scales heavily weighted in the bombardier's favor—that bombing readily identifiable targets in perfect weather conditions with no enemy fighter or flak opposition was the ultimate simplification of the problem involved. Bombing enemy installations under combat conditions would be a different proposition.

Unfortunately, some air-power enthusiasts lacked the professionals' caution. The result was a general public misapprehension concerning the accuracy of high-altitude bombing. This came to be known as "pickle-barrel accuracy" and spread the completely false impression that American bombers could drop their loads in a barrel from 20,000 feet. Nothing could be more unrealistic. Under combat conditions in the western European Theater—admittedly the most heavily defended area on the war map—our bombers have a good day when, operating from 25,000 feet, they manage to concentrate their destructive load in a factory area the size of a city block. And when they do, it's a bad day for the enemy.

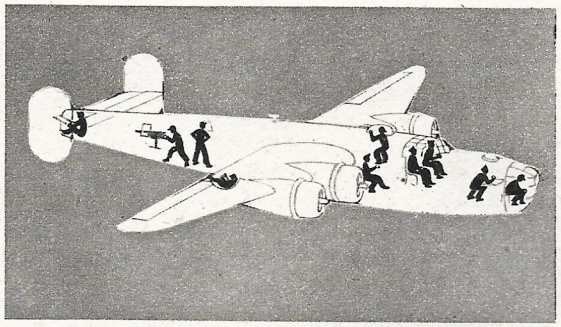
By midsummer of 1939 delivery had begun on the B series of the Forts. In December of this same year a second type of four-engined bomber was made available when the Consolidated Aircraft Company produced the first of a long series of B-24's—later to be known as Liberators. The B-24's had greater medium-altitude speed, greater range, and greater load-carrying capacity than the B-17's but sacrificed some of the Forts' defensive fire power and high-altitude speed. When war broke out in Europe in September, British orders for improved versions of both ships were placed and the tempo of production and modification was immeasurably increased.

While the evolution of our weapons was progressing, the Air Force was painstakingly developing the method by which the weapons could be used. This involved an entirely new concept of crew training. It was found that the ten-man crew of a heavy bomber had to work as a completely integrated unit during all the crucial phases of an operation. With a maximum allowable straight-and-level bombing run of forty seconds over the target in combat conditions, split-second teamwork was necessary. Bombardiers, navigators, and gunners assumed roles of equal importance with the pilots, for unless each did his job faultlessly the mission was liable to end in failure or disaster.

At the same time, the problem of the actual piloting had to be considered in the light of large-scale operations. Flying the heavily loaded planes at extreme altitudes had presented problems even to the veteran fliers who were then permitted to handle the controls. Now the Air Force had to anticipate the employment of thousands of young and comparatively inexperienced pilots who would be flying these same airplanes under combat conditions. The answers to these perplexities were the main concern of our bombardment experts during the several years preceding our entry into the war.

The rough blueprint of American heavy bombardment was at hand and the implementation of the plan was in progress. The next question was : where and how would it be used ?

The weapon was the first to receive its trial. The first of the B-17C's, faster and more heavily armed than their predecessors but without tail guns, armor, or leakproof tanks, arrived in England early in 1941. British unofficial opinion was skeptical. The Forts' first mission under the aegis of the RAF was an attack on the German cruiser *Gneisenau* at Brest. Hits were claimed and the planes returned undamaged. On July 26 a Fortress attacked Emden and on August 2 Kiel was bombed. Both raids were without loss. On an August 16 raid a Fortress was attacked by seven German fighters and beat them off.



THE LIBERATOR (B-24D)

Length	66 ft.
Wing Span	110 ft.
Height (Vertical Fin)	18 ft.
Weight (Gross)	60,000 lbs.
Bomb Load (Average)	8000 lbs.
Speed (Cruising)	225 m.p.h.
Horsepower	4800
Armament (.50-cal. Machine Guns)	10

And then, during a strike against Oslo on September 8, two of the four Forts dispatched fell victim to enemy fighters. Shortly after, daylight raids with this early version of the B-17 were discontinued. British opinion remained unconvinced. The designers of the American Plan, watching these experiments from across the Atlantic, were content to wait for a trial of the improved bombers then being constructed and the operational technique they had conceived.

The new planes continued to accumulate defensive armor and armament, speed and bomb capacity. The B-17E, with which the VIII Bomber Command operations were started in England, carried thirteen machine guns, two power-driven turrets and a tail-gun position. These planes also incorporated the second great development of the bomb-aiming process. This was the Automatic Flight Control Equipment—an American invention which permitted the bombardier, through his manipulation of the bomb sight, automatically to control the flight of the plane during the bomb run.

With its airplanes, its bomb sight, its AFCE, its tactical theories, and a nucleus of trained combat crews, the VIII Bomber Command traveled to England in the middle of 1942 and set about a job which had never been done before. High-altitude precision bombing of key enemy targets by day might or might not be possible. The VIII Bomber Command, standard-bearers of a brave new idea, meant to prove it could be done. The following chapters tell the story of the first year of this effort.