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The decisive weapon in the air war over Western Europe. North American P-51 "Mustang."

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THE AIR FORCE HISTORICAL FOUNDATION

A TRIBUTE TO DUTCH KINDELBERGER

The Mustang — A Great War Horse

“It seems to me that one of the great ‘miracles’ of the war was the fact that the full long-range fighter escort did appear over Germany at just the right moment in the very nick of time to keep our bomber offensive going without a break; and some of the people who achieved this were the same ones who made the initial mistake.”

From—GLOBAL MISSIONS

Memoirs of Gen. Henry H. (Hap) Arnold
Commanding General U. S. Army Air Forces
World War II

LIKE GIANT MOTHS, their antenna and guns bristling, 183 U. S. bombers lifted off their runways in southern England into the grey dawn of a mid-August morning in 1943. Quickly coagulating into tight formations in the frigid stratosphere, they rendezvoused with their P-47 escort fighters. The mission for the day was a deep penetration of Nazi Germany—to the ball-bearing factory at Schweinfurt and an aircraft assembly plant at Regensburg. Over the ancient city of Antwerp the fighters banked sharply and headed back for England. Their tanks were low and they could go no farther. The bombers, unprotected, continued on.

Soon the enemy struck. ME 109s and FW 190s arrowed down from above in darkly symbolic javelin formations and sprayed the Flying Fortresses with 20 mm shellfire. The bombers huddled protectively closer to one another and feebly returned the fire. The fighters buzzed them like angry gnats. The air battle was severe, with big odds against the bombers. They maintained their defensive formations and devastated their assigned targets, but the cost in bombers destroyed was high. Sixty bombers did

not survive the battle and 90% of those that did were battle damaged. Six hundred (600) men were lost over Europe and more than three hundred (300) got back to their bases as dead or wounded casualties of that fateful mission. The Regensburg force flew on to bases in North Africa while suffering a loss of 36 bombers, and the Schweinfurt force returned to England with a loss of 24.

This was the most disastrous raid in World War II of the fledgling Eighth Bomber Command. It was the first time the German Air Force had come up in numbers to try to stop a large formation of daylight bombers. They had not succeeded; the targets were bombed, but at a heavy price.

A short time later, on October 14, another mission to Schweinfurt was laid on. This time 229 bombers headed for the target, accompanied on the first leg by 196 escort fighters of the VIII Fighter Command. Two hundred and forty miles from England the short-legged fighters turned back. Again the Germans attacked, and the high battleground was again littered with flaming and falling bombers. Another sixty Fortresses were destroyed, 600 airmen

lost. The meaning of these two catastrophes was chillingly clear; the decisive superiority of fighters over bombers had not been fully sensed. Without long-range fighter escort, the daylight precision bombing effort could not be maintained. The Eighth simply could not stand the high rate of attrition.

For months, ever since June 1943, the Allied High Command was aware of the need for long-range fighter escort. The German Air Force had been rising in growing numbers and with increasing vigor to intercept American bombing formations. That month Assistant Secretary of War for Air, Robert A. Lovett, reviewed the American air effort in England and reported his findings to General Hap Arnold. "Fighter escort," he said, "will have to be provided for B-17s on as many missions as possible . . ." And Arnold issued an ultimatum to Gen. Giles in England: "Within the next six months you have got to get a fighter that can protect our bombers. Whether you use an existing type or have to start from scratch is your problem. Get to work on this right away. . . . I want a fighter escort for all of our bombers from the U. K. into Germany." This was a long cry from the judgment of the same man a few years earlier when, as commander of March Field, he concluded flatly after watching air maneuvers that fighters would be ineffective in wartime.

This had long been the pre-war Air Corps' doctrine. The aviation emphasis, as Douhet and Mitchell espoused it, was on bombers. Their invulnerability, born of speed and armor and armament, was underscored. To have stressed the need for a fighter, either to escort friendly bombers or intercept the enemy's, would have weakened the zealot's ardor. He could not concede that the bomber was anything less than a self-sufficient and indomitable master of the air. The experience of the opening days of the U. S. air war in Europe confirmed this. The bombers had no trouble completing their first dozen missions. The Germans had diverted much of their

fighters to the Russian front and had shown little zeal for air battle until the bombers began hurting them. Gen. Ira Eaker, commanding general of the Eighth Bomber Command, said boldly that "successful bomber operations can be conducted beyond the range of fighter protection." And when Goering's Abbeville Kids, as his fighter pilots were called, began to ping away at Eaker's bombers, his tactical solution was simple;—send more bombers. This, he reasoned, could create enough diversionary forces to scatter the enemy's air defense and it would also enable the Eighth to saturate-bomb the factories and airfields from whence the fighters came. Three hundred to five hundred bomber missions, said Eaker, would lick the Abbeville Kids.

The Germans, meanwhile, armed their fighters with 20 mm cannon which were deadly at a range of 800 yards—well beyond the reach of the bomber's return fire. And later they armed their FW-190s with powerful 30 mm cannons.

The buildup of losses, climaxed by Schweinfurt, began slowly. At the end of 1942, the Eighth Bomber Command had 27 missions under its belt, none exceeding 79 planes. On many of these missions, all shallow ones mainly to the submarine pens on the French coast, the Fortresses were escorted by P-38 Lightnings. And, at the end of 1942—the day before Christmas—the first group of P-47 Thunderbolt fighters arrived. As losses began to build up the British sent Spitfire escorts to accompany U. S. bombers. But the Spitfires and P-47s and P-38s could not go all the way to the targets the Liberators and Fortresses were hitting. The P-38, which had the longest escort radius, could not go more than 350 miles, and the Spits could make only shallow penetrations over the continent. The bombers began to fall from the skies like rain, as the Germans jumped them as soon as their escort left. Sixteen out of 183 were destroyed on June 22nd, and 24 out of 199 did not return from a July 26th mission, and 22 out of 95 were lost on July 28th. These

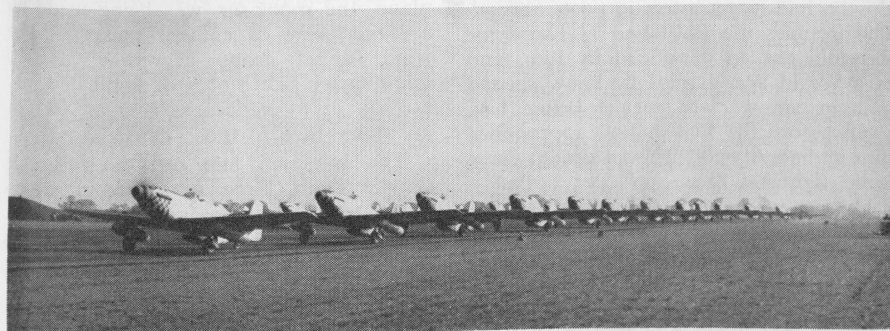
Eaker received his biggest blow: higher headquarters siphoned off most of his fighters to the Twelfth Air Force which had just been activated for the North African campaign. When 60 pilots and all the planes of the 78th Group, a P-38 force, was ordered from England to North Africa, Eaker betrayed a new respect for fighter escort and wrote to Gen. Carl "Tooney" Spaatz: "I think this was the most serious blunder we have made in a long time."

It was in North Africa that fighters first proved themselves as bomber escorts. Gen. Jimmy Doolittle, the doughty commander of the Twelfth, wrote Arnold in late 1942 that out of sixteen missions flown only one was conducted without escort and the only loss—two planes—was sustained in that mission. Here basic tactics were worked out, doctrines proved and confidence established. The Eighth Fighter Command in England was virtually stripped as four groups were siphoned off for North Africa and the famed Fourth Fighter Group, then equipped with Spitfires, was the only remaining escort group in England.

The sixth-month time bomb that General Arnold had planted—the one which was to explode a new fighter into the scene—began ticking away immediately. Actually there was such a plane in existence although in the shadows. It was

a remarkable airplane and the story behind it—as well as the story ahead of it when it finally got into combat—is one of the more thrilling episodes in the short but exciting literature of flight. The airplane was the P-51 Mustang, and it was born at the moment it was needed, thereby fulfilling the first requisite of greatness. And before the final shots of the war were fired, it had proved its worth.

In April 1940, the war in Europe had been on for eight-and-a-half months. The Stukas and ME-109s were clouding the skies over the Low Countries and France, and the British were carefully nursing their few Spitfires and Hurricanes. The RAF, more sophisticated in aerial doctrine than most major powers, knew it needed another kind of plane—one for offensive action against Germany. The Spitfire was to be its great defensive fighter, the interceptor which would so greatly inhibit the Luftwaffe over England. The fighter which RAF commanders wanted in great numbers was the American Curtiss P-40 Warhawk, an Allison-powered plane well-suited for low-level work. It was used successfully against the Japanese by the Flying Tigers and it proved invaluable on the Western Desert against Rommel's tanks. In order to build up a large P-40 force quickly, the British sent an Air Purchasing Commission to place an or-



Soon these North American P-51s of the 353rd Fighter Group, lined up on an airfield in England, will be seeking combat with the German Luftwaffe. December 1944.

Official U. S. Air Force Photo

der for P-40s with a young, aggressive aircraft company named North American Aviation.

North American was only six years old as a producer of aircraft; before that time it had been a holding company with a large portfolio of investments in most of the major aircraft and aircraft equipment companies of the time—Sperry Gyroscope Co., Inc., Ford Instrument Co., Inc., Douglas Aircraft Corp., et al. Its best-known product was the Harvard trainer which the RAF and, eventually, the air forces of 23 allied nations used extensively. Built along fighter lines, it was the training plane in which most British war pilots learned their flying. The British remembered the speed with which North American produced it in 1938. It was built, crated, shipped through the Panama Canal and across the Atlantic, uncrated and test-flown in 120 days from the time production was first begun.

When the British Purchasing Commission approached James H. "Dutch" Kindelberger, the salty president of North American, and offered him an attractive production contract for P-40s, Kindelberger turned them down. He had many reasons. First off, he was convinced his crack engineering team headed by Lee Atwood, with whom he had worked for years when they were both at Douglas, could build a better plane—and in greater numbers. Dutch had been watching the air war in Europe closely, had many listening posts abroad. The troubles the P-40 had at Kasserine Pass did not go unnoticed by him, and as a World War I pilot he knew second best in air warfare meant being last. Even before the British had approached him he had Atwood draw a design for a basic fighter. "No one ever pulled a rabbit out of a hat," Kindelberger once explained, "without carefully putting one in." The Mustang was Dutch's exquisite rabbit.

Another reason Dutch wanted to make the Mustang was that it was designed for mass production . . . the P-40 was not. "The time to start worrying

about production is before you begin product engineering," he said. The plane was designed to be made in many parts; large units were broken down into smaller components for ease of assembly and installation. The wings alone were made in six sections. Dutch brought Detroit techniques to Southern California.

The Mustang design was first shown to the British in April 1940. They were assured in New York that North American could build the best fighter plane in the world, and within 120 days! This was convincing, and the British gave a preliminary go-ahead for further detail design. At North American's plant in Inglewood, California, on Saturday that same day the structural design group began the inboard profile drawings and labored on them until Kindelberger entered the room at 10:00 A.M. Sunday. Dutch initialed his approval. A preliminary weight study was attached and all data were airtailed to the Britishers who were impatiently waiting in New York. They liked the design, and in three days North American had an order to proceed.

Kindelberger swung NAA into its vital work with a vigor that was dazzling. Paper work and red tape were forgotten. Interoffice memos took the place of official orders and even drawings. The instant that data could be released it was sent to the experimental shop where the full-size wooden replica of the airplane, the mock-up, was being made by a large crew of cabinet makers. The wind tunnel group carved a \$20,000 one-quarter size model of laminated mahogany to tolerances as fine as .001 of an inch—rare in those days.

The loftsmen laid out the full-scale drawings on large tables from which templates used in production were made. The purchasing department waived all regulations and sent men out on trucks to have parts made on verbal instructions from the preliminary design group.

One casting was needed in four days because a critical part had to be machined properly. Normally it would have



A formation of North American P-51 "Mustangs" on patrol.

Official U. S. Air Force Photo

taken three weeks, but the engineers could not wait. A worker was dispatched to stand by until the hot casting was peeled out of the mold, and in two days the casting was delivered.

The design group was housed in a drab room directly over Kindelberger's office and one engineer later recalled that "the Mustang materialized out of that smoke-filled room where men knew no hours, where lights never went out, where for days all you could hear was the rattle of paper, the sharpening of pencils, and the noise of men knocking out their pipes on waste baskets. . . ." Engineers worked an average of 16 hours a day. "Sunday was different," one recalled, "only because the hum from the adjacent factory was missing."

To get the kind of airplane that was needed, daring and ingenious innovations had to be made. Speaking later of the engineering effort Kindelberger said that "the situation called for the highest degree of initiative, speed, and caution—three attributes which normally do not descend together on an engineering department. . . ." The design touchstone of the Mustang was the laminar flow wing, a high-lift, low-drag airfoil developed by the National Advisory Committee for Aeronautics (NACA) and considered by most engineers as being too revolutionary for use in a mass produced airplane. The chiefs of the aerodynamics section believed in it so thoroughly that they promised in case of failure to produce

a conventional wing within 30 days. Since wing design is the toughest of all components and usually determines the schedule for the rest of the design job, the entire project hung tenuously on the then-unproved laminar flow concept.

There were moments when Kindelberger and Atwood thought they had failed. The first wind tunnel test of the one-quarter scale model wing in the California Institute of Technology tunnel showed that although the drag was the lowest on record—fifty per cent less—the stalling characteristics were bad. The airfoil was quickly but carefully modified and a new model was built in a week. Again, the silk tufts glued to the wing surfaces did not act satisfactorily. But now the engineers suspected that the model was too large for the tunnel; the walls were affecting the air flow at the wing tips. The wing was loaded into an airliner—its first flight was *inside* a plane—and flown to a larger wind tunnel at the University of Washington in Seattle. There it passed all tests with flying colors. The laminar design wherein the greatest thickness of the wing was moded well back and was followed by a teardrop-shaped trailing edge, gave tremendously improved lift and also the structural strength to withstand the "shock waves" which the plane would later experience in its high-speed combat maneuvers, maneuvers which tore the ME 109s and FW-190s apart.

To reduce the frontal area as much as possible, North American chose the liquid-cooled in-line Allison engine which powered the P-40. This presented the problem of a large drag-producing radiator scoop conventionally placed at the nose of the ship. Atwood placed it under the fuselage and aft of the pilot. But early flight tests showed the engine was not being cooled adequately. A wind tunnel test showed that the disturbed boundary layers of air beneath the wing and fuselage prevented a "clean" flow through the radiator. The entrance lip of the scoop was lowered one inch. The turbulent air was thus bypassed and perfect air circulation was attained. The fuselage, the smallest cross-sectional area ever to be placed behind an Allison engine, offered low-drag but demanded high-density packing of the equipment—radios, compasses, hydraulic systems, etc.—which had to go into it. "It's like stuffing the insides of a bomber into a fighter," one engineer lamented.

The first Mustang, minus an engine and with makeshift landing gear borrowed from an AT-6, was rolled out of Building One and into the bright California sunlight exactly 100 days from the placement of the order. Designated NA-73, it got its first taste of air on October 26th in a test flight which was eminently successful. The first Mustang arrived in Liverpool in crates: the Merchantman carrying it had been bombed en route but the airplane was undamaged. It could not be flown until anti-aircraft batteries and RAF fighter squadrons could be briefed on it: the airplane looked too much like an ME 109 and might have been shot down. On its first demonstration flight an American test pilot put it through a 500 m.p.h. dive and several low-level speed runs. RAF officials at first refused to believe the performance data and the flight had to be re-run. It was not long before they admitted that it outperformed their beloved Spitfire, but more meaningful British recognition of the

plane's greatness came when a London pub named a cocktail after it.

The Mustang was a pilot's airplane. Control and balance were such that when a pilot operated the stick he was not conscious of moving the control column. "You don't fly this airplane," said one pilot, "you wear it." Armed with two .50 calibre MG 53-2 Browning machine guns mounted below the engine plus one .50 calibre MG 53 and two .30 calibre MG 40 guns in each wing, its strike power was truly amazing. On its first flight to Germany, the first flight any fighter based in the United Kingdom made into the Reich, a Mustang hit a military camp on the Dutch border, strafed a factory and gas tanks at Lathen, shot up barges and lock gates along the Dortmund-Ems and, on the way back, set fire to a 500-ton ship on the Zuider Zee and exploded another vessel. Later, at Dieppe, the Mustang supported ground troops, flew reconnaissance and provided a key segment of the aerial umbrella which kept the Luftwaffe from making a shambles of the orderly evacuation.

Even before its first flight on October 26, 1940, the British, impressed by the startling progress of Kindelberger's team, placed an order for 320 Mustangs. The U. S. government approved this with the proviso that two of the aircraft be turned over to the Army Air Corps for test and evaluation. Accordingly, the fifth and tenth ships to roll off the North American assembly line were sent to Wright Field and designated XP-51. The plane performed exceptionally well but not as a high-altitude airplane. "Below 22,000 feet," an official report said, "the P-51 . . . has the best all-around fighting qualities of any fighter." Its top speed of 386 m.p.h. was reached at 15,500 feet and its service ceiling was 33,800 feet (compared with 450 m.p.h. at 24,000 feet and a 43,300 ceiling for the "D" model built in mid-1944), but it outmaneuvered anything in the air. It was an excellent low-level ground-support aircraft. U.S.A.A.F. fighter policy at the time was hinged to the P-47 and

the P-38, and the two P-51 prototypes did not change that policy quickly.

In the autumn of 1942, the U. S. military attache in London, Major Tommy Hitchcock, reported to Washington that the Mustang was one of the best "if not the best" fighter airframe developed to that date. A world-renowned polo player before the war, Hitchcock was also a pilot and he had flown the Mustang. He suggested, and American Ambassador to the Court of St. James, John Winant, endorsed the suggestion that the Mustang be cross-bred with the powerful Rolls Royce Merlin 61 engine. This would give it a high-altitude capability. Hitchcock's opinion was soundly confirmed by such aviation authorities as Eddie Rickenbacker and Air Marshal Sir Trafford Leigh-Mallory.

The Army Air Force dragged its heels. Somehow it regarded the Mustang as a "foreign" airplane, designed to British specifications for British use. The Mustang's spectacular performance at Wright Field and Eglin, and in the skies over Europe, however, inexorably won over even the most dogged skeptics. After the war Gen. Arnold said that on only one occasion did he overrule an Air Material Command's recommendation on aircraft procurement. The decision came after he toured the North American production line and had a talk with Gen. Carl Spaatz who was then organizing the Eighth Air Force. "That's the plane I want," said Spaatz. "If that's what you really want," said Arnold, "you'll get it." Testifying before the House Armed Services Committee later, Arnold said: "I was never sorry for that decision."

The Merlin engine, which converted the P-51A to the P-51B, proved a spectacular improvement and gave the Mustang a high-altitude capability that put it in a class by itself. Flight tests in September 1942 showed that it climbed to 20,000 feet in 5.9 minutes compared with 9.1 minutes for the P-51A, and it had an overall speed increase of 26 per cent. Even before the flight tests were completed General Arnold reported to

President Roosevelt that 2,200 Merlin-powered Mustangs had been ordered by the A.A.F. By the summer of 1943 they were in full-scale production at Inglewood and a new North American plant at Dallas. It was this airplane that the Senate War Investigating Committee headed by Harry Truman called "the most aerodynamically perfect plane in existence."

In December 1943, the P-51B made its appearance on the war scene. Overnight the bomber escort radius jumped from 320 to 650 miles. When the dual 108-gallon external tanks were added to the P-51 a few months later, the escort radius fanned out to 750-850 miles. The new plane was not only a dependable escort, it was a tough fighter. It could turn on a dime at high speed; it could climb like a bullet, and best of all it had shrugged off the label of a low-level performer. A report of the Army Air Forces Tactical Employment Trials, dated February 12, 1944, said: "There is a considerable difference in the overall handling and performance of the P-51A and the P-51B. The latter is far superior, particularly at high altitudes. "The P-51B has good performance at all altitudes, but above 20,000 feet the performance improves rapidly, and its best fighting altitude is between 25,000 and 35,000 feet. The aircraft maintains a speed of 400 m.p.h. or better from about 11,000 feet to 40,000 feet. At 40,000 feet the aircraft indicates 210 m.p.h. in level flight, and can still be maneuvered, as it is not hanging on its propeller. The rate of climb is outstanding. Above 20,000 feet the overall fighting qualities of the P-51B-1 aircraft are superior to those of all other types used in the trials."

In the first fifty-five days of combat the P-51B shot down 13.1 enemy aircraft per 100 sorties as contrasted with 4.3 for the P-38 Lightning and 2.7 for the P-47 Thunderbolt.

The dribble of new planes swelled into a flood, and by May 1944 there were seven P-51 groups in the Eighth Fighter Command headed by Maj. Gen. William



A P-51 "Mustang" breaking free from weather limitations—taking off on an icy runway in the fog.

Official U. S. Air Force Photo

E. Kepner. Of these, one group, the 4th, was destined to distinguish itself as the outstanding Mustang unit anywhere.

The 4th Air Group, composed of the 334th, 335th and 336th Squadrons, and headed by Col. Don Blakeslee, was stationed at Debden, forty miles north of London. The pilots got their P-51s on Feb. 28, 1944. They had the planes ready for operational flying the very next day. Some of the pilots took off with less than an hour's checkout in the new plane. Four days later, on March 4, they escorted the heavy bombers over Berlin. It was the first time single-engine fighters had made the trip.

The very next day the P-51B group escorted some Liberators almost to Spain. And the day after that they were again over Berlin, gunning down 17 enemy planes which tried to interdict the bombers. They rested a day, then went back again into action.

When Col. Don Blakeslee, RAF-trained, first flew in Spitfires in the early days of the war, he did well to stay up for an hour-and-a-half. With

the Mustangs he led his men on seven-hour missions.

The extreme range of the P-51 led to a dual mission effort. Some Mustang groups, after seeing their bombers safely home over the North Sea, returned to the fray without landing and made additional sweeps over the Hamburg area, destroying shipping, locomotives, troop concentrations—"anything that moves," as one mission directive read.

In the very first month of operation the P-51 pilots, with Blakeslee's 4th Group, accounted for 156 German planes, a new one-month record for any U. S. Fighter Group. In that hectic month, the group won the Presidential Citation.

In April the record for monthly kills was again broken by the Fourth with a score of 207. Generals Eisenhower, Doolittle, Spaatz, and Kepner came to the base to look at the plane that was helping change the course of the war. Two months later Eisenhower flew over the Normandy beachhead to survey battle progress in a specially modified Mus-

tang piloted by Maj. Gen. Elwood "Pete" Quesada.

The Eighth Fighter Command, after initial experience with the Mustang, said in a report on tactics and techniques, "The P-51 has met with tremendous success by being able to accompany the bombers over their deepest and final penetration where formerly they had little if any escort."

"When did you know that the Luftwaffe was losing control of the air?" General Spaatz asked Reichsmarshal Hermann Goering after the war. "When the American long-range fighters were able to escort the bombers as far as Hanover." It was not long before they got to Berlin. Goering said he could not believe his eyes when he saw them over his capital. Continuing his appraisal, Goering observed: "The reason for the failure of the Luftwaffe against the Allied Air Forces was the success of the American Air Forces in putting out a long-range escort fighter airplane which enabled the bombers to penetrate deep into Reich territory and still have a constant and strong fighter cover. Without this escort the air offensive would never have succeeded."

Lt. Gen. Karl Koller, Chief of Staff of the Luftwaffe, said that American long-range fighter cover came as something new and fatal to Germany. Without this cover he hoped to inflict losses as high as 30 per cent on unescorted bombers, a rate of attrition which would have made daylight bombing too costly.

On February 10, 1944, Mustang and other fighter craft helped start the mass fighter destruction of the Luftwaffe by downing 86 German aircraft over Brunswick. The all-out offensive was carried on by all Allied fighter groups, but nowhere with more striking results than the 4th. In one mission in April the 336th Squadron claimed 26 enemy aircraft destroyed and 16 damaged—the greatest score ever claimed by one squadron in the United States Army Air Force for one mission. Blakeslee's P-51 pilots were the first in the Eighth Fighter Command to reach 400, 500, 600, and 700

enemy aircraft destroyed. The 4th ended the war with a total of more than a 1000-on the ground and in the air.

On June 21, 1944, 65 Mustangs attached to the group flew for seven hours and 15 minutes on the first of the historic shuttle raids from England to Russia. They joined over Poland with three bomber combat wings and fought their way to Piryatin airdrome in Russia. They returned by way of Italy, destroying 15 enemy aircraft during the mission, with the loss of only one plane.

The plane literally flew its way into the hearts of the men whose lives depended on it. 1st Lt. Leonard Warner spoke of the toughness of the P-51 when he stated in his official report on return from a Berlin mission on Oct. 6, 1944 . . . "I tacked on an ME-109 that slipped through the bombers and hit for the deck. The last time I looked at my meter I was clocking 600 m.p.h. and still gaining. The wing-tips and the rudder of the ME came flying back at me. I didn't have to fire. The ME went in still shedding its controls."

From another combat report: "A patrol of eight P-51s sighted 20 ME-109s south of Druex at 11,000 feet. Orbiting in elements of two, the patrol climbed to 14,000 feet and attacked from above. At the same instant 60 ME-109s joined the combat, emerging from a cloud to the north. In the next 15 minutes, the Mustangs, outnumbered 10 to 1, were busily embattled from 11,000 feet to the deck. The enemy was aggressive and apparently experienced, but they tried to turn with our aircraft. When it was all over, the squadron pilots had destroyed 11 and damaged two enemy aircraft against the loss of two planes."

In the early months of 1944, Mustangs began operating in Burma in support of airborne troops attacking Japanese lines of communications 200 miles behind the Assam-Burma front. P-51Bs were also introduced into the Fifteenth Air Force in Italy and on May 5, 1944, RAF Mustangs, operating from eastern Italy smashed the great Pescara Dam by bombing. Not one Mustang was lost on

this operation, which was a remarkable feat for single-engine fighters. It was in this same theatre that two A-36s, dive-bomber version of the Mustang, attacked and sank a 50,000 ton Italian transport of the Conte Di Savoia class, the world's sixth largest liner, at anchor off a quay at Bagnara in southwestern Italy.

The Mustangs fought with distinction in every theatre of WW II. In the first week of April, 1944, the combat log showed that A-36s blasted Littorio rail yards in the northern part of Rome; Mustang ace Don Gentile shot down his 22nd enemy plane over Germany to tie another P-51 pilot, Capt. Robert Johnson for top score among U. S. fighter pilots; Mustangs attacked a Japanese staging field at Aungban in Central Burma and destroyed 24 enemy fighters; the fourth and other Mustang groups staged major-scale all-fighter sweeps above Germany to hunt down the battered Luftwaffe and struck as far as Berlin and Munich. And this same week Mustangs made a record 1500-mile daylight flight deep into Poland on bomber escort. They protected the Forts as they dumped bombs in Pozan, 150 miles east of Berlin, on the Port of Gdynia on the Gulf of Danzig, and on Tutow on the Baltic Coast. And at Terracina on the Appian Way bottleneck in Italy, A-36s cleared the way for advancing troops. Next day, on April 10th, Mustangs carried out the longest mission of the war when they escorted bombers to Armiswald, just east of Stettin, Poland. A year later, in one period during June 1945, the 348th Fighter group of the Fifth Air Force in the Philippines shot down 231 Japanese aircraft—with the loss of only one plane—and the pilot of that one was rescued.

Last of the nine Mustang models was the F-51H which was powered by a 2,000

h.p. Packard Rolls Royce engine. It was 10 per cent stronger than the "D" and 700 pounds lighter. It was the fastest—490 m.p.h., most maneuverable, highest and fastest climbing, and the longest-ranged (2,000 miles) Mustang. It was the first land-based fighter plane to attack Tokyo after the capture of Iwo Jima. The "H" was taken out of mothballs during the Korean War when ground-support aircraft were urgently needed. They held their own against Russian MIG-15s before they were relieved by another North American airplane, the F-86 Sabrejet, and retired permanently.

A total of 14,819 Mustangs had been built since the prototype NA-73 was turned out. Those which reached combat flew 213,873 missions, and in the European Theatre alone destroyed 4,950 enemy aircraft in the air and 4,131 on the ground.

This much can be told statistically, but the full measure of the Mustang cannot be taken in figures. That it was superior to enemy fighters and knocked them out of the skies in great numbers was not the most significant contribution the airplane made to the successful Allied war effort. Rather, it was the fact that it made daylight precision bombing possible, and it was daylight precision bombing which brought victory in a thousand days over a foe whose boast was that it would last a thousand years. The Mustang earned a warm place in the memories of the thousands of crewmen of Flying Fortresses and Liberator bombers, men who knew them by their radio call of "Little Friends." It was these "Little Friends" who faithfully flew their good shepherd missions, sweeping the skies of enemy fighters before them and, wing-to-wing, guiding crippled bombers with their helpless crews safely back to base.