

Flying the Hell Stretch

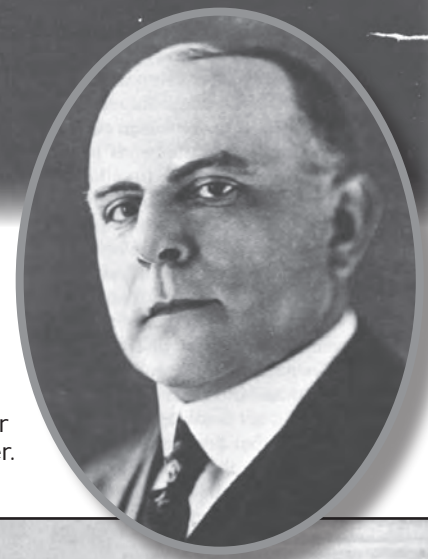
Bonny Farmer
Photos from the Daniel
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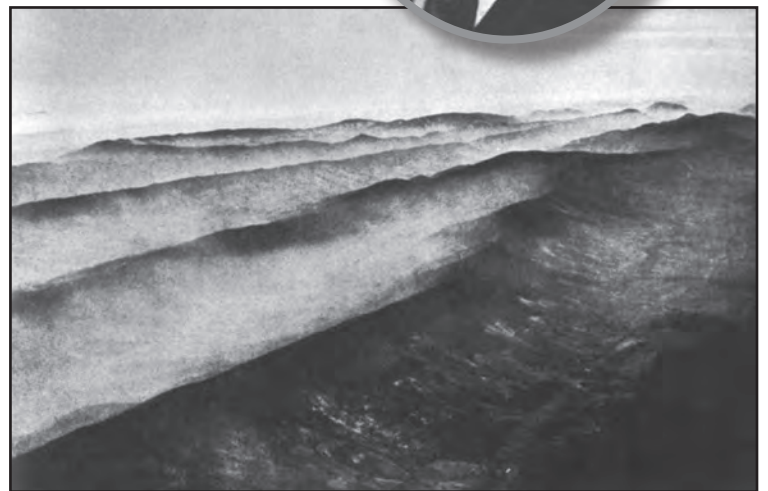
Flying the "Hell Stretch."

When Assistant Postmaster General Otto Praeger proposed an air mail connection between the two major economic centers of New York City and Chicago, the worst part of the proposed route was the flight over the Allegheny Mountains that run southwest to northeast through Pennsylvania. Most of the state was covered with thickly forested mountain ridges whose tops were often covered by fog and low-lying clouds. To make matters worse, there were few emergency landing sites to be found. As late as 1924, a survey of potential emergency landing strips reported: "Suitable plots of forty acres or more, which do not require extensive preparation, simply do not exist in Pennsylvania."

In his book *The Airmail Jennies to Jet*, the first Superintendent of the Air Mail Service, Benjamin B. Lipsner wrote: "It should be mentioned that the route across the Allegheny Mountains was considered by some the ultimate in dangerous flying, and by others it was called absolutely impos-



Assistant Postmaster
General Otto Praeger.



Fog typically found lying along the Allegheny Mountain ridges

sible. Later this stretch became known as the 'graveyard' or 'hell stretch,' and famous pilots then and even later declared that transporting passengers across it would never be safe or practical."

Even under perfect conditions, the fragile, single-engine biplanes available for the fledgling Air Mail Service could not make the long haul from New York to Ohio without a stop for refueling. The first site suggested was Lock Haven, along the easily identifiable West Branch of the Susquehanna River. But on his survey flight in



September 1918, pilot Max Miller also made a landing on the outskirts of Bellefonte — in a field belonging to Tom Beaver, today the site of a PennDOT garage and the Belle-



fonte Area High School. He liked both the approach and the absence of early morning river fog and recommended that the refueling stop be built there. The farmer's field was duly purchased, and an air field with hangers and repair shop hastily built. The final route would be New York–Bellefonte–Cleveland–Bryan–Chicago. The landing field was indicated with a large white circle; a later effort also spelled out the town's name for the pilots to see. The flight from New York to Bellefonte covered 215 miles.

The first hangers and a repair shop at the Bellefonte Air Field were wooden; they burned in a fire September 1919 and were replaced by a metal hanger. On June 13, 1925, new air field, better suited for night flights, was built two miles southeast of the old operation. Landing lights of 500,000,000 candlepower lit the surroundings for a mile around in a half circle. From Hadley Field, New Jersey to

Above: Popular pilot Max Miller was the first to land at Bellefonte.

He was killed en route to Bellefonte on September 1, 1920, only twenty miles from Hazelhurst Field, when his Junker JL-6 #305 caught fire in midair and dove into the ground, killing both Miller and AMS mechanic Gustav Rierson.

Above Right: Max Miller in his Martin Bomber Air Mail Plane, Bellefonte Air Mail Field, 1919.



Above: The original wooden hangers at Bellefonte.



Above: White circle marks the original Bellefonte Air Mail Field; approach from the west.

Above Right: "Bellefonte" spelled in large white letters helped orient pilots.



Above: Arrival of morning mail from Cleveland.

PERSONNEL, BELLEFONTE AIR MAIL FIELD, 1921



Above: "Personnel Bellefonte Air Mail Field, 1921." Standing (L to R): Thomas Beaver (owner of the original farm field), Pilot Paul Collins (one of the pilots who helped search for the missing Ames in 1925), Pilot Elmer Leonhardt (killed in a crash 1923), Dr. David Dale, Maurice Kelly, Forrest Tanner (who identified Ames' body), Fred Gelhaus (Field Mgr.), Charles Gates, Ellis Hines. Sitting (L to R): Samuel Weaver, Earl Kline, John Woods. Background: DeHavilland (DH-4) Air Mail Plane.



Above: Air mail hangar lit by floodlights.



Above: "Mail Delivery, Aviation Field. Bellefonte, Pa." The photograph shows Pilot Wesley Smith watching mechanics transfer mail from his DH-4 to a U.S. Mail delivery truck.

Cleveland, the flight over "Hell Stretch" was lit at night with forty-six red routing beacons and twenty-nine white emergency field beacons.

The first scheduled New York to Chicago flight took place December 18, 1918. Pilot Leon D. Smith left the temporary air field at Belmont Park race track, outside New York City, at 6:20 a.m. with 224 lbs. of mail, but immediately returned because the plane's engine was overheating. He took off again at 7:20 but got lost and

landed in State College, about twelve miles southwest of the Bellefonte Air Field. He later called that stretch "the worst route in the country."

The pilot for next leg, Edward A. Johnson, left Bellefonte on schedule at 9 a.m., but without New York mail. He got lost trying to find Cleveland, and finally set down ten miles away from the city. He reached Cleveland the next day but had mechanical problems at Bryan (140 miles further on), and the mail finally was sent on to Chicago by train.

The second flight was slated for December 21, 1918. This time the pilot, Dean I. Lamb, flew successfully from New York to Bellefonte, but when he asked field manager Carlton Kemper for a map to Cleveland, he discovered that Kemper had been unable, despite repeated requests, to get a flight map from headquarters. Lamb decided to chance it; not surprisingly, he got lost. In the end, bad weather and mechanical problems combined to keep the New York–Cleveland leg of the route out of operation until July 1, 1919.

It wasn't only the changeable wind direction and velocity and the typical foggy conditions that made flying across the narrow mountain ridges between New York and Cleveland so treacherous, the planes themselves were still in the experimental stage. Engines were not reliable, landing gear often could not support a rough landing, aeronautical navigation instruments did not exist, and bad weather flying techniques had not yet been developed. Pilots were forced to fly close to the ground to make out landmarks, a dangerous procedure in mountainous terrain. Weather-related crash landings were only exacerbated by Otto Praeger's standing directive to pilots: "Fly by compass. Visibility not necessary." When pilots protested being asked to fly in weather so poor they could not see, Prae-



Above Left: "Lt. Charles Lamborn."

Above: Lamborn's plane slammed into a hillside just twelve miles from Bellefonte.

ger, a man with no flying experience, responded: "Pilots either must fly or resign. Everybody must understand that the route must operate or the service [will be] suspended until we can fly on schedule. Situation too serious to play with." Although designated emergency fields were in some instances only ten miles apart, by the time the Air Mail Service ceased operation in 1927 more fatal accidents had occurred along this stretch than along any other part of the transcontinental route.

Between December 16, 1918 and July 16, 1921, thirty Air Mail Service employees were killed in crashes; twenty-two were pilots. Improvements in the planes themselves, the increasing experience of the intrepid pilots, and a portion of good



Above: Fred Robinson seated in his plane.

Right: Robinson's DH-4, lying on its back in the Susquehanna River.



luck led to a period of nearly a year with no further fatalities. Then on September 7, 1922, Walter J. Smith's plane stalled and crashed on take-off from the Indianapolis Fair Grounds. There followed six deaths in 1923, three deaths in 1924, one in 1925, one in 1926, and one in 1927, the year the carrying of the mail went private. Of the total of forty-three fatalities, thirty-four were pilots; six of these pilots died while attempting to fly the "Hell Stretch."

The first fatality on the treacherous Allegheny leg of the New York to Chicago flight was Charles W. Lamborn, appointed to the Air Mail Service on June 8, 1919. Lamborn was assigned the Bellefonte to Cleveland portion of the flight. He left Bellefonte on July 19, 1919, at 10:20 a.m. with 404 pounds of mail. The weather was miserable, with fog, low clouds, and periods of heavy rain. He stayed below the clouds to Milesburg, but to cross the Snow Shoe mountains had to enter the thick cloud cover, where he apparently became disoriented. Witnesses saw the DH-4 appear through the clouds, nose down, about 400 feet above the ground. Lamborn was unable to recover in time and the plane crashed at Dix Run only twelve miles west

of Bellefonte. Lamborn's body was found under the wreckage: he had broken both legs and ankles, ribs, and his collar bone. He died of his injuries before he could reach a hospital. He had been on the run two weeks.

The second pilot to be killed on the "Hell Stretch" was Frederick A. Robinson, appointed to the Air Mail Service April 6, 1919. On September 27, 1920, "Robbie" was flying from Hazelhurst Field, New York, to Bellefonte, carrying fourteen bags of mail. Due to the heavy fog, he had left Hazelhurst five hours late. Now he was flying low, following the course of the Susquehanna River north, trying to make up time. Just south of the small town of Millersburg he hooked his landing gear on the new telephone wires that had been strung across the river. His plane hit the water tail first; Robinson was killed on impact. He was 23 years old. Only five months earlier he had been involved in a crash into the railroad tracks beside Heller Field, New Jersey, that left him seriously injured and killed his passenger, air service clerk Clarence Stapleton.

Pilot Elmer G. Leonhardt, appointed to



Above: Elmer Leonhardt in pilot's gear.

Right: Leonhardt in "civies."



the Air Mail Service September 19, 1919, was a familiar face at the Bellefonte refueling stop. Leonhardt was flying the Bellefonte–Cleveland leg on February 26, 1923, when he became trapped in dense fog near Meadville, in Crawford County, Pennsylvania, in the upper northwest corner of the state. He tried to set down in a field but hooked the landing gear of his DH on a double-wire fence, flipping the plane. Leonhardt was thrown out and killed.

Unlike some of the new pilots, Leonard Brooke Hyde-Pearson was an extremely experienced airman when he joined the Air Mail Service February 10, 1923. Born in Yokohama, Japan, in 1901 to British parents, Robinson flew for the Royal Air Force in World War I, winning both the British Meritorious Service Cross and the Royal Victorian Order. When the United States entered the war, he went to Kelly Field, Texas, to train new pilots. He became a test pilot, known for his "willingness to fly



Above: Leonard Brooke Hyde-Pearson in mail plane.

any plane, old or new." He was the first to make non-stop flights from Edmonton, Canada, to New York City; from Tulsa, Oklahoma, to New York City; from Omaha, Nebraska, to New York City; and from Kansas City to New York City. He pioneered the use of equipping planes with skis for landing and take-off in winter conditions, and was invited by Amundsen to accompany the latter's polar expedition (he declined).

Hyde-Pearson was flying the Bellefonte–Cleveland leg on March 7, 1924, when he ran into bad snowstorm near Grampian, Pennsylvania (about fifty miles northwest of Bellefonte). Blinded by the snow, he crashed into a tree at the top of a mountain and the plane slid into a small ravine; everything in the plane burned. He was 23 years old.

In a letter to mother, Mrs. Kate Hyde-Pearson, "To Be Opened Only After My Death: Capt. Leonard Brooke Hyde-Pearson, USAMS," he wrote: "I trust your eyes may never see this. But should God desire that you do, at least know that he called me, like many more who have given their lives for the future of this wonderful game."



Above Left: Hyde-Pearson in Royal Air Force uniform.
Above: Youthful Hyde-Pearson beside plane.

Enclosed was a poem addressed to:

My Beloved Brother Pilots and Pals

*I go west, but with cheerful heart.
 I hope whatever small sacrifice I have made
 May be of some use to the cause.*

*When we fly we are fools, they say.
 When we are dead, weren't half-bad fellows.
 But everyone in this wonderful aviation service
 Is doing the world far more good than the
 public can appreciate.*

*We risk our necks; we give our lives;
 We perfect a service for the benefit of the
 world at large.
 They, mind you, are the ones who call us
 fools.*

*But stick to it, boys. I'm still very much with
 you all.
 See you all again.*

Perhaps the most well-publicized fatality on the "Hell Stretch" was that of Charles Hayden Ames, appointed to the Air Mail Service December 3, 1920. Like many of the air mail pilots, he had joined in the U.S. Army Air Corps during World War I. At the age of twenty-three, he was already older than many of his fellow students when he enlisted in 1917. He became an instructor at Brook Field, San Antonio, Texas, and at Kelly Field, also at San Antonio. After the war he became an instructor at Curtiss, in Kokomo, Indiana. All in all, he had about 700 flying hours before signing on with the Air Mail Service.

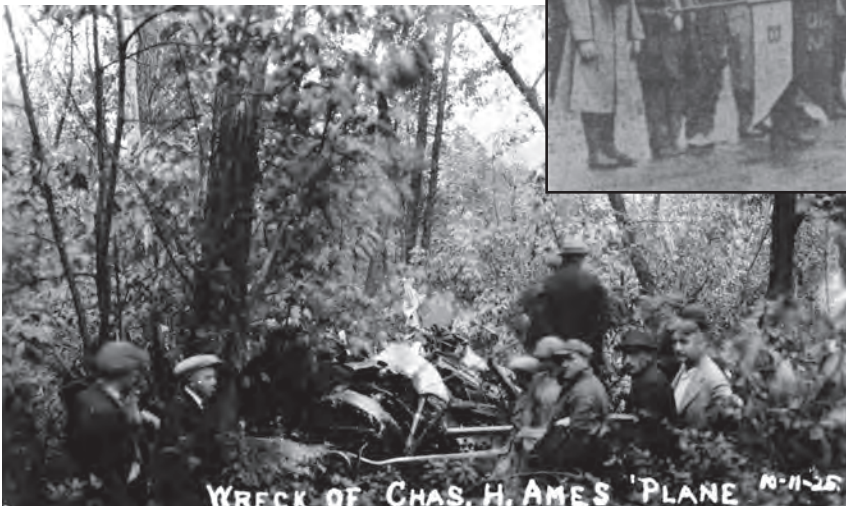
When he left Hadley Field, New Jersey, for Bellefonte on October 1, 1925, there had been bad weather for the last three days and the sky was overcast, with a 5,000-foot ceiling. By the time he was approaching Allentown on the Pennsylvania-New Jersey border, the ceiling had dropped to 1,500 feet with 15-mile visibility. He was the only plane due in at Bellefonte that night; all other flights had been canceled due to the weather. When Ames didn't arrive at his scheduled time of 11:30 p.m., the field manager began to track his flight. Phone calls established that he had last been sighted over the Millheim beacon light (about twenty miles east of Bellefonte) at 11:35 p.m.

The next day was too foggy for an air search, but foot parties set out to try to locate the missing plane. By October 5 no trace of Ames or his plane had been found, and pilots started dropping leaflets offering a \$500 reward for information. Governor Pinchot called out 300 members of the National Guard (including the 52nd Machine Gun Squadron and



Above Left: Ames as a flying cadet in 1917.

Above: Ames, center of photo, stands talking with fellow pilot Wesley Smith. Both men wear the bulky parachutes developed in 1922; they were designed to be sat upon during flight.



Old newspaper photos show some of the rescue activity following Ames' disappearance.

Above Left: "Squadron of Airplanes Combing Hills for Lost Aviator."

Above: "Troops Mobilizing to Take Part in Search Near Bellefonte."

Left: Wreckage of Ames' plane found October 11, 1925

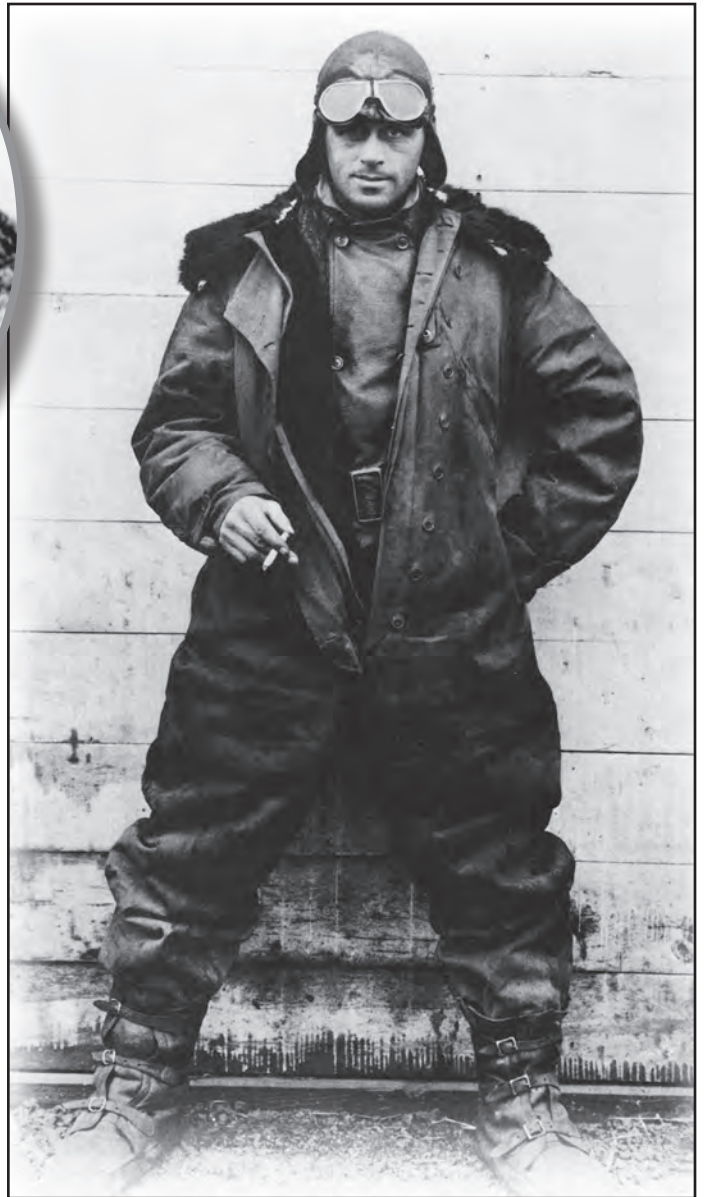
Troops B & F of the 104th Cavalry), and a thousand Pennsylvania State College students were mustered as well. Carl F. Egge, Superintendent of the Air Mail Service, set up emergency headquarters at Bellefonte. Finally, on October 11, a search party found the wreckage of the plane on the upper slopes of Hecla Mountain, four miles west of Bellefonte.



Investigators found that the plane had been flying directly on course when it struck the east side of the mountain, about 200 feet from the summit and just below the Hecla Gap Light. Ames' body was still in the cockpit, his safety belt broken. He had died on impact when his head hit the plane's dashboard. The plane's wings had been destroyed in crash and the fuselage wedged in thick trees, making the wreck impossible to see from air. All switches were on and the throttle was advanced; the estimated speed at impact was 130 mph. Experts theorized that a local drop in barometric pressure had caused a false reading on the plane's primitive altimeter, causing Ames to believe he was flying safely above the ridge. All thirteen mailbags were recovered intact. Ames' body was identified by Bellefonte chief mechanic Forrest Tanner. Ames was thirty-one years old.

One positive thing came of Ames' death — his friend Howard Salisbury, a Cleveland Air Field instrument technician, was inspired to develop a modified and vastly more accurate aeronautical altimeter, based in part on a report Salisbury read of a German mountain climbing altimeter. In 1990 Daniel Lucas placed a permanent marker to Ames at site of the crash.

The last of the original Air Mail Service pilots to die flying the "Hell Stretch" was William Cochran Hopson, popularly known



Above left: "Wild Bill" Hopson

Above: "Wild Bill" Hopson in heavy winter flying gear, cigarette in hand.

as "Wild Bill." Originally appointed to the Air Mail Service April 14, 1920, Hopson epitomized everything that was glamorous and reckless about the early pilots. On one occasion, in order to keep a date, he hitched a ride on the wing of a loaded mail plane and flew from Bellefonte to New York holding tight to the guy wires. As a favor to air field clerk Charlie Gates, he dropped love letters (weighted with bolts) to Gates' girlfriend in nearby Hecla Park.

Hopson set two speed records and made the first night flight from Omaha, Nebraska, to Chicago on July 1, 1924, but he also

made more than the average number of forced landings (at least thirteen in 1926), including one at Bellefonte on August 11, 1920, when his motor quit as he started to land. Hopson reported: "I had too much speed and altitude to land on field, not enough to turn and land. I started over ball field at west end of field and hit on a small corn field adjoining. Ship is a complete washout." There was talk of firing him, but Superintendent Colyer noted: "We will have more than enough breaking in new pilots without increasing the number. Hopson has ever shown a willingness to any duty assigned him without question. He is exceptionally dependable." This, despite an earlier letter to Hopson from Colyer on July 23, 1920 that read, in part:

"I have heard numerous reports of your stunting mail ships. This is absolutely against regulations and further actions of this kind will merit disciplinary action.

Do you not realize that the mail service is a business proposition and everything that is not done in a businesslike manner cannot be tolerated?"

When the Air Mail Service was turned over to private concerns in 1927, "Wild Bill" went to work as a mail pilot with the National Air Transport Company; he had logged more than 4,000 flying hours with the Air Mail Service and flown more than 413,000 miles. He had only been flying for National Air Transport a little over a month when his plane crashed in a densely wooded area near Polk, Pennsylvania, just north of the regular air mail route, shortly after midnight on October 18, 1928. Hopson was on his way from Bellefonte to

Cleveland, flying low in heavy rain, when he hit the top of a tall tree. A newspaper account the following day reported:

"Having successfully negotiated the high mountains of central Pennsylvania, the 'graveyard' of aviators, it was apparent that Hopson was flying low at great speed when he struck the tree, a dead chestnut, that protruded high above its fellows in a tract of woodland.

Thirty feet of the tree was broken off and carried to the ground with the ship, which crashed into a second tree before its momentum was halted. Wreckage of the plane was strewn for 50 feet and Hopson had been hurled head foremost to the ground.

Indications were that the plane had taken fire immediately after it hit the tree. Part of the wreckage was charred, and Hopson's body was burned beyond recognition."

Hopson had been carrying a heavy load of mail — half a ton — only ten pounds of which (a few letters and two packages) were recovered from the burned wreckage. He was thirty-eight years old.



Crash Landings

Flying as low as 100 feet above the ground, in unreliable airplanes and in all kinds of weather, it is not surprising that there were many crash landings. What is more incredible is that many times the pilots survived.



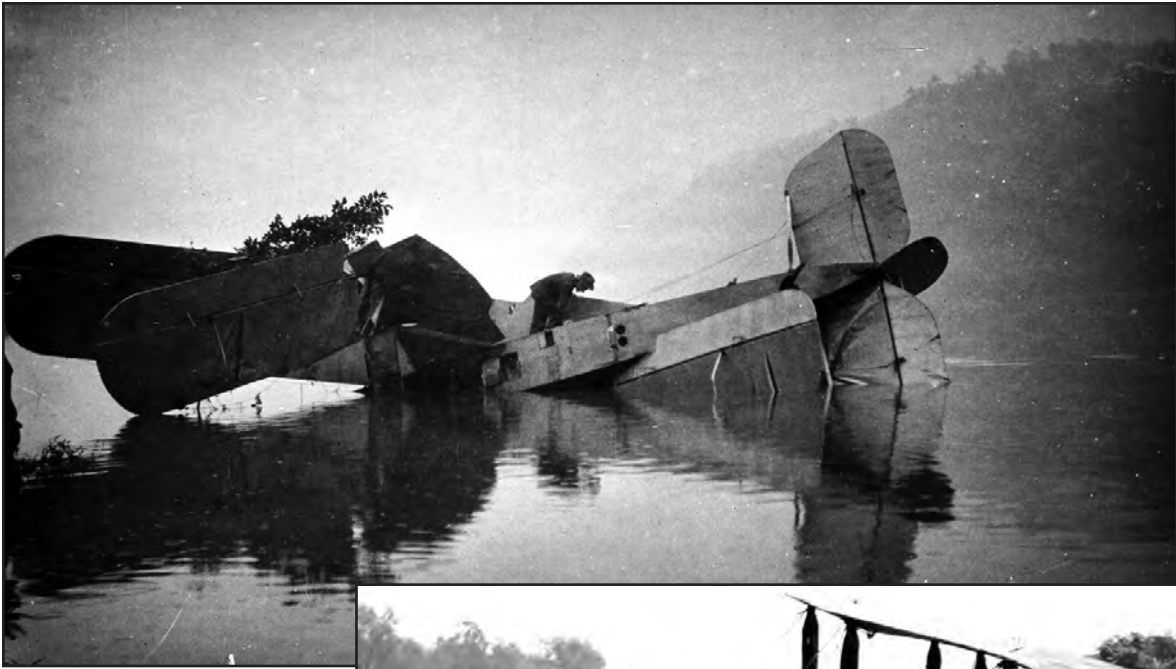
Above: Taxiing down a snow-covered field.
Left: Flying into low cloud cover.



Left: "Pilot Geo. Bradford crashed in a mountain east of Bellefonte when engine quit. Bradford received broken nose & head injury as shown in picture. Also - Bradford shown in inset (Oct. 1919)."

Bottom: "This bird (DH-4), flying west bound mail, ran out of gas short of the Bellefonte Air Mail Field — 1919."





Above: "Wrecked Mail Plane and Its Heroic Pilot."
Right and Below: Pilots landed wherever they could find minimum room to touch down.





Above: Sometimes they ran out of room, as in this June 17, 1919, crash landing.



Above and Right: Sometimes the planes never left the field. As this plane was preparing to depart the Bellefonte Air Mail Field on November 14, 1919, its Liberty engine caught fire and the wooden plane was quickly destroyed.





Trees were always a hazard in the thickly wooded Allegheny Mountains.

Left: Pilot beside downed plane.

Below: Plane lies on its back where it flipped after hitting trees.



Left: Rivers made excellent navigational aides in good weather but posed treacherous obstacles to pilots flying low in fog.

Some of the Mail Planes



Above Left: The Martin Bomber was the first U.S.-designed bomber used by the U.S. Army in World War I; later, a small number were converted for air mail use with two Liberty-12 engines (800hp).

Above Right: The Standard JR1-B originated as a two-seat trainer plane during World War I. Improvements near the end of the war — giving it a 150hp Hispano-Suiza motor, a top speed of 100 mph, and a range of 280 miles — led the Post Office to buy six Standards for the new Air Mail Service.



CURTISS HA (CURTISS BULLDOG)

The Curtis HA ("Curtiss Bulldog") with Liberty-12 engine.



CURTISS R-4

The Curtiss R-4 with its 400hp Liberty-12 engine (affectionately nicknamed "overgrown Jennies") could land in a short space at slow speeds, a vital trait when an emergency landing field was often just that — a farmer's field.



TWIN ENGINE DE HAVILLAND (ELLIS HINES, ANDREW SAYLOR)

Twin engine deHavilland with two Liberty-6 (Hall Scott) engines, 400hp. The plane proved to have dangerous structural problems, added to which, its inability to fly on one engine led to its being withdrawn from service late in 1920, barely a year after its introduction. Standing on the wing: Ellis Hines and Andrew Saylor.



DE HAVILLAND (DH-4)

Originally plagued by stalling problems, the improved deHavilland DH-4 with its Liberty-12 engine became the standard Air Mail Service plane beginning in July 1921. The reliable DH-4 became the workhorse of the post-war U.S. Army Air Service as well as the U.S. Post Office.

TRANSCONTINENTAL AIR MAIL.PILOT'S LOG OF DISTANCES, LANDMARKS, AND FLYING DIRECTIONS.

I. NEW YORK TO BELLEFONTE

Miles

0. *Hazelhurst Field, Long Island* — Follow the tracks of the Long Island Railroad past Belmont Park race track, keeping Jamaica on the left. Cross New York over the lower end of Central Park.

25. *Newark, N.J.* — Heller Field is located in Newark and may be identified as follows: The field is 1¼ miles west of the Passaic River and lies by the New York, Lake Erie & Western Railroad. The Morris Canal bounds the western edge of the field. The roof of the large steel hanger is painted an orange color.

30. *Orange Mountains* — Cross the Orange Mountains over a small round lake or pond. Slightly to the right of course will be seen the polo field and golf course of Essex County Country Club. About 8 miles to the north is Mountain Lake, easily seen after crossing the Orange Mountains.

50. *Morristown, N.J.* — About 4 miles north of course. Identified by group of yellow buildings east of the city. The Delaware, Lackawanna & Western Railroad passes the eastern side of Morristown.

60. *Lake Hopatcong* — A large irregular lake 10 miles north of course.

64. *Budd Lake* — Large circular body of water 6 miles north of course.

78. *Belvidere, N.J.* — On the Delaware River. Twelve miles to the north is the Delaware Water Gap and 11 miles to the south is Easton at the junction of the Lehigh and Delaware Rivers. The Delaware makes a pronounced U-shaped bend just north of Belvidere. A railroad joins the two ends of the U.

111. *Lehighnton, Pa.* — Directly on course. The Lehigh Valley and Central Railroad of N.J., running parallel, pass three miles through Lehighnton. The Lehigh River runs between the railroads at this point. Lehighnton is approximately halfway between Hazelhurst and Bellefonte. A fair-sized elliptical race track lies just southwest of town by a larger and better emergency landing field lies about 100 yards west of the track. The field is very long and lies in a north-south direction.

114. *Mauch Chunk* — Three miles north of Lehighnton and on the direct course.

121. *Central Railroad of New Jersey* — Two long triangular bodies of water northwest of the railroad followed by eight or nine small artificial lakes or ponds about half a mile apart almost parallel with the course but veering slightly to the south.

148. *Catawissa Mountain Range* — which appears to curve in a semicircle about a large open space of country directly on course. To the north of the course may be seen the eastern branch of the Susquehanna. Fly parallel to this until Shamokin Creek is picked up. This Creek is very black and is paralleled by two railroads. Shamokin Creek empties into the Susquehanna just below Sunbury.

168. *Sunbury, Pa.* — At the junction of the two branches of the Susquehanna River. The infield of a race track on a small island at the junction of two rivers furnishes a good landing field. The river to the south of Sunbury is wider than to the north and is filled with numerous small islands. The two branches to the north have practically no islands. If the river is reached and Sunbury is not in sight, look for islands. If there are none, follow the river south to Sunbury. If islands are numerous, follow the river north to Sunbury.

170. *Lewisburg, Pa.* — Two miles west of Sunbury and 8 miles north.

174. After leaving Sunbury, the next landmark to pick up is Penns Creek, which empties into the Susquehanna 7 miles south of Sunbury. Flying directly on course. Penns Creek is reached 6 miles after it joins the Susquehanna 7 miles south of Sunbury.

178. *New Berlin, Pa.* — Identified by covered bridge over Penns Creek.

185. *The Pennsylvania Railroad* from Lewisburg is crossed at the point where the range of mountains coming up from the southwest ends. The highway leaves the railroad here and goes up into Woodward Pass, directly on course. A white fire tower may be seen on the crest of the last mountain to the north on leaving the pass.

202. The next range of mountains is crossed through the pass at Millheim, a small town.

A lone mountain may be seen to the south just across the Pennsylvania Railroad tracks.

217. Bellefonte, Pa. — After crossing another mountain range with a pass, Bellefonte will be seen against the Bald Eagle Mountain Range. On top of a mountain, just south of a gap in the Bald Eagle Range at Bellefonte, may be seen a clearing with a few trees scattered in it. This identifies this gap from others in this range. The mail field lies just east of town and is marked by a large white circle. A white line marks the eastern edge of the field where there is a drop of nearly 100 feet.

II. BELLEFONTE TO CLEVELAND

Miles

0. *Bellefonte.* — Compass course to Cleveland, approximately 310°. Fly directly toward and over bare spot on mountain top south of gap in Bald Eagle Range. First range of mountains.

3. *Pennsylvania Railroad*, following course of Bald Eagle Creek.

17. *New York Central Railroad*, following course of Moshannon Creek.

35. *Clearfield, Pa.* — On west branch of Susquehanna River. A small race track here serves as an emergency landing field. Two railroads, one from the north and one from the east, enter Clearfield and both go south here.

55. *B. & M. Junction* — One branch of the Buffalo, Rochelle & Pittsburgh from the east forms a junction here with the N. & S. line of the Buffalo, Rochelle & Pittsburgh Railroad. Dubois is 2 miles north of course on the N. & S. line of the railroad.

70. *Brookville, Pa.* — One mile north of course, west of city, is a 2-mile race track which makes an excellent emergency field.

86. *Clarion, Pa.* — One mile north of course. Emergency field marked by white cross and red-brick hanger is here. The Clarion River passes north edge of city. Railroad from the east ends here.

110. *Franklin, Pa.* — Seven miles north of course at junction of Allegheny River and French Creek. Cross Allegheny River where there is a pronounced horseshoe bend. This is due south of Franklin.

122. *Sandy Lake* — Two miles north of course. Cross the Pennsylvania Railroad at right angles 2 miles south of Sandy Lake.

138. *Shenango, Pa.* — Two miles north of course. Three railroads enter this town from the north. Two continue south and one runs east for 3 miles and then turns southeast.

152. *New York Central Railroad*, running north and south. One mile north of course the Erie crosses the New York Central at right angles. Four miles west of Erie should be crossed where it turns southward. Eight miles south of course is Warren, with eight railroads radiating out.

157. *Pennsylvania Railroad*, running north and south.

165. *Baltimore & Ohio Railroad*, running diagonally northeast-southwest.

206. *Cleveland on Lake Erie* — The mail field is in East Cleveland between the two railroads that follow the lake shore. The field is near the edge of the city and near the edge of the freight yards of the New York Central. The field is distinctly marked by a long cinder runway. The air mail hangar is in the southwest corner of the field. The Martin factory is in the northwest corner of the field.