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The Aircraft Accident Investigation That Never Was

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The Beginnings

Most aviation historians point to the beginning of airmail service in the U.S. as the beginning of the airlines. The airmail inaugural flights began on May 15, 1918, from the polo grounds in Washington D.C. It was an important event at a time when the country was embroiled in a World War in Europe. President Wilson was there at the polo grounds for the sendoff as was the Second Assistant Postmaster General, Otto Praeger, to whom the responsibility for launching the service rested (Brady, 2000, pp. 125-129). Praeger was later to become known as the Father of Airmail. Also present were Benjamin Lipsner and Reuben Fleet. There is some controversy as to which person, Lipsner or Fleet, had the responsibility of running the fledgling air mail service. According to Lipsner, he was the person responsible. He states in his book, “. . . on July 15, 1918, my resignation from the Army was approved . . . the Post Office appointed me to the post of Superintendent of the United States Aerial Mail Service, in complete charge of its operation and maintenance” (Lipsner, 1951, p. 70). This is supported by a document in the national archives signed by the Postmaster General and dated July 18, 1918, which states that, “Benjamin B. Lipsner, Superintendent, Division of Air Mail Service, is directed to such points in the United States at such times as may be necessary. . . on official business in connection with operations of the Air Mail Service. . .” (Burleson, 1918).

This document was written in July 1918, but the airmail service had been launched using both Army airplanes and Army pilots the previous May. Who was running the show then? According to Lipsner it was him. He describes a meeting with Otto Praeger in which he introduced the idea of starting an airmail service and one which Postmaster General
Burleson supported. As Lipsner describes it, “And that is how I happened to be in the delivery room when the airmail was born” (Lipsner, 1951, pp. 65, 66).

In contrast to that, Otto Praeger claimed in a 1938 radio interview that Ruben Fleet was in charge. In responding to a question regarding early airmail, Otto Praeger said, “. . . the United States Army stepped into the picture with the suggestion that air mail flying would fit in excellently with its training program and it offered to operate the service without cost to the Post Office Department during the period of the war” (Bomar, 1938, p. 2). Regarding Fleet’s appointment, Praeger stated that “a Major of the Air Service, young, unusually capable, and full of pep” (Bomar, 1938, p 2.) was brought to the airmail meeting by an Army colonel.

And that is where Major Reuben H. Fleet . . . entered the picture of the air mail.

The Colonel . . . turned sharply to Major Fleet and said, “All right, Major, it’s your baby,” and left the room. The Postmaster General officially designated Major Fleet as Superintendent of Air Mail Service. With great energy he organized his staff and assembled his equipment, and with military precision started the actual flying operations of the Air Mail promptly on the hour set on May 15, 1918 (Bomar, 1938, p. 2).

**The First Airmail Flight**

Whether it was Lipsner or Fleet, the record is not clear. What is clear however is that they were both there and each tells a different story about an incident in which the airplane that would launch the airmail service, an Army JN-4 Jenny, failed to start because it was out of gas. Ruben
Fleet who had flown the airplane into the Polo grounds about 25 minutes before the inaugural flight was to commence said,

I had designated Capt. B. B. Lipsner who was not an aviator, and had been detailed by Air Service Production at his request to the Aerial Mail Service, to have gasoline at the Polo Field in Washington. He failed in his mission and didn’t have a drop of gasoline there. We drained gasoline from a British airplane and two American airplanes that were on the field, and filled the aerial mail airplane (Wagner, 1976, p. 56).

Lipsner’s version of the events tells a different story (Brady, 2000, p. 127).

With the prop standing tall, there was a great deal of confusion, embarrassed looks, head scratching, and unorganized milling around. Lipsner asked the chief mechanic if he had filled the gas tank after the plane landed. The mechanic's mumbled response told Lipsner the problem. He said that the gauge read full so he did not add any gas. The gauge on the Jenny was designed to read correctly in level flight. On the ground, with the nose pointed skyward at a good angle, the gauge could read full with an empty tank. Boyle's tank was, in fact almost empty. Lipsner pushed his way through the crowd, siphoned some gas from a dismantled plane and from an automobile and filled the 21-gallon tank on the Jenny. This time when the mechanics propped the engine it caught and started smoothly.

Which version is the more accurate? Perhaps this 1934 memorandum responding to an outside query helps answer the question (General Superintendent, 1934).
March 17, 1934.

Memorandum for
Mr. Branch:

BENJAMIN E. LIPNER.

Mr. Otto Praeger, Second Assistant Postmaster General, appointed him General Superintendent, Air Mail Service, effective July 15, 1918. Services discontinued December 6, 1918. Inspectors Moore and Clarahan submitted report under date of December 24, 1918, charging serious irregularities in expense accounts.

Under date of March 30, 1919, the Deputy Second Assistant Postmaster General submitted a memo to Mr. Howes reading:

"Captain Benjamin E. Lipner was appointed General Superintendent of the Air Mail Service effective July 15, 1918. I find in the files an order by the then Second Assistant Postmaster General, Mr. Otto Praeger, to discontinue his pay and services effective at the close of business December 6, 1918; also, copy of a report by Inspectors C. W. Moore and C. H. Clarahan, dated December 24, 1918, charging serious irregularities in the submission of expense accounts. The files are not very complete as to just what transpired, but my understanding is that Captain Lipner's services during the short time he held the position were very unsatisfactory and that the relations between him and Mr. Praeger were quite strained and acute. Should you desire anything further, I think Mr. White has personal knowledge of some of the things that transpired."

General Superintendent.
Perhaps there is a scenario in which each version can be accommodated: Captain Lipsner was indeed in charge of the new Aerial Mail Service in which Major Fleet was detailed to supply the Army airplanes and pilots. This would put a Major reporting to a Captain and it is doubtful that an ego as large as Fleet’s could tolerate that. But, technically, Lipsner was more civilian than military, having been loaned by the Army to the Post Office. The radio interview of Otto Praeger some twenty plus years later does not support this hypothesis but perhaps Praeger misspoke about Fleet’s relationship colored by his obvious distaste for Lipsner.

Regardless of which hypothesis one supports, it was Lt. George Boyle of the U.S. Army Air Service who was selected by the Post Office to conduct the first flight. It was to be from the Polo grounds in Washington D.C. to Philadelphia. The mail sacks were loaded on the airplane with much pomp and circumstance and Lt. Boyle took off then barely cleared the trees at the end of the field. He circled the polo grounds, gaining some altitude, then turned southwest, almost directly opposite of the direction to Philadelphia (Lipsner, p. 20). A short time later he landed near Waldorf, Maryland, unsure of his location. Several accounts give us different views of the incident. According to William Peake, a reporter for the Washington Post, Boyle “made a forced landing on the State highway near Waldorf, Md. The propeller and undercarriage was smashed in the landing. . .” (Peake, 1929, Washington Post, p. SM1). According to Rueben Fleet, Boyle “landed in a plowed field near Waldorf, Maryland. . . and flipped the plane over on its back breaking the propeller” (Wagner, 1976, p. 56). Yet another view comes from the pilot himself, Lt. George Boyle. His entire explanation is worth repeating.

In leaving Washington relied on compass and veered from proper course. When aware of this fact landed near farm house to ascertain position. Here three people gave their
different ideas of direction but said I was 35 or 40 miles South West of Washington.

Unable to rely on this information and not confident of compass, I took off and landed near Waldorf MD. Purpose was to ascertain from Post Office my real position. Landed in good looking large field. Field was soft however and machine nosed over after having made good landing, slightly tail low. Propeller and [blank] were broken. Otherwise ship O.K. . . . (Boyle, 1918).

Copies of the front and back of Boyle’s flight record are shown next. 

![Pilot's Daily Report](image1)
![Flight Record](image2)

Notice that in Boyle’s written narrative (back of flight record) there is a blank space between ‘and’ and ‘were’ in the fifth line from the bottom. Perhaps a word or words were

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1 This document is an extremely important part of aviation history because it is the single document that marks the beginning of the airline industry of the U.S. Given that the airline industry grew from the delivery of mail by air, this flight record is that of the first airmail flight of scheduled air mail delivery in the continental U.S.
originally there but were later erased. The sentence reads “Propeller and [blank] were broken” (Boyle, 1918). Since the rest of his description has subject and verb agreement and this sentence has a plural verb, one is led to believe that something else besides the propeller was broken. This seems to lend some credence to the report by the Washington Post.

The Post Office gave Boyle another chance on a different day and he got lost again, crash landed and broke a wing on the plane. The Post Office wanted to give him a third chance but Reuben Fleet put his foot down and sent Boyle back to flight school to get some more practice in cross-country flights (Wagner, p. 56).

One would have to ask why a Second Lieutenant fresh out of flight school would be chosen for such an important and historic flight, one with the President of the United States in attendance. The answer is political motivation. Boyle’s father-in-law-to-be was an important figure on the Washington scene. He was a judge and an Interstate Commerce Commissioner whose influence with Post Office officials provided the opportunity for Boyle (Wagner, p. 54).

**Post Office Operation**

The shaky start of airmail and the murky organizational structure of the new Air Mail service between the Post Office and the Army were short lived. In August of 1918, the Post Office severed its relationship with the Army and took over its own operation using its own airplanes and pilots (Brown, 1980, p. 91). Not long after this, the war in Europe was over and there was a glut of pilots, mechanics and airplanes.

The airmail service chose as its primary airmail aircraft the war surplus De Havilland DH-4, designed in England and built in the U.S. The airplane was powered by a “400 h.p. American Liberty engine, a V-12 which was created by Detroit’s engineering team to an air corps
specification during the war. The more powerful engine enabled the DH-4s to clear the mountains” (Retell True Story, 1968 p. A11). The gross weight of the airplane was about 3,400 pounds.

The airplane had acquired an unfortunate moniker: flaming coffin. Both the Army Air Service and the Air Mail Service were flying the aircraft. “In a twelve month period, from midsummer 1920 to midsummer 1921, the Army Air Service suffered 330 crashes and 69 fatalities. The Army fliers complained bitterly about the De Havillands and called them ‘flaming coffins’” (Josephy, Jr. p. 200). The name goes back even further. In his book, *Fighting the Flying Circus*, Captain Eddie Rickenbacker points out that pilots flying the DH-4 in 1918 called them “Flaming Coffins” (p. 188). This was due, in part, to a weak landing gear and the design of the airplane which had the fuel tank forward, behind the engine, followed by two tandem seats. In a hard landing, the gear would collapse forcing the pilot forward close to a fuel tank that may have been ruptured by the crash. The ignition source was the hot engine exposing the pilot to burning fuel, thus the name flaming coffin.

When the Air Mail Service began flying the DH-4, the mail was placed in the back seat of the tandem seated aircraft and the fuel tank was located forward of the front seat. In a nose-first crash the pilot was sandwiched between the mail and the fuel. The Air Mail service modified the aircraft by strengthening the landing gear, moving the pilot to the aft cockpit, and placing the mail in the front cockpit; these changes made the DH-4 a much safer machine, although it was a challenge to fly from the back seat (Brady, p. 129).

In a March 25, 1920, Post Office document, the statistics covering eight months of flying the air mail include a column titled *Trips Started* followed by another column entitled *Trips*
Completed Without Forced Landings (Post Office Department, p. 3). The very necessity for the second column almost tells the story.

At that time there were twenty air mail pilots. Over the eight month period beginning in August 1919 and ending in March 1920, those twenty pilots experienced more than 200 forced landings. Those pilots had a one in five chance of having to execute a forced landing each time they flew. For the 200 plus forced landings in the reported eight month period, 23% were attributed to mechanical problems and 77% were due to weather (Post Office Department, p. 3). Amazingly (by today’s standards), this was considered good news. The Post Office department prepared a congratulatory document that stated,

As a demonstration of the reliability of the Liberty engine, the efficiency of the Air Mail pilots and the airplane mechanics in the Air Mail service, the Post Office Department points to the remarkable performance of the twenty Air Mail Aviators now in the service who during the past eight months have made 1,111 trips carrying the mail with but 47 forced landings through mechanical trouble (p.1).

Even with the associated hazards, at least flying the mail for the U.S. government was a flying job, one of the few available. Ironically, there were plenty of airplanes available and they were cheap. Many ex-military flyers bought war surplus Jennys and took to the road barnstorming from town to town. When a reporter asked a barnstormer what the most dangerous thing about flying was, the pilot replied, “The risk of starving to death” (Komons, 1989, p. 12.).

The Night Flight Experiment

By late 1920, the airmail pilots were flying the mail coast to coast, but only during the day. At night the mail was put onto trains until the following morning at which time it would be
transferred to an airplane and the journey continued. Otto Praeger had plans to request funds from Congress to light the airways and several airports but a new administration had been elected, the Harding administration, and they were not an aviation-minded group. In those days, the new administration took office in March rather than in January as they do now. This meant that February, one of the worst weather months in the U.S., was chosen for the demonstration.

As a last-gasp effort to save civil aeronautics, the postal authorities under hard-driving Assistant Postmaster general Otto Praeger, and the volunteer flying postmen had decided to fly the mail for one night without beacons or landing lights or navigational aids other than bonfires. They picked Washington’s Birthday, at the tag end of winter, as the last possible moment to arouse popular enthusiasm and spur the outgoing Congress to action (Taylor, 1962, p. 3).

The plan was to launch two DH-4 aircraft from the east and head them west, pony express style, while at the same time launch two from the west and head them east. The two from the east immediately ran into trouble with the northeast winter weather and could get no further than Chicago. The following is the Post Office’s official report of the westbound flights that began February 22, 1921 (White, 1921, p. 2):

Pilot Allison in DH #195 left Hazelhurst Field at 6:14 a.m. and arrived at Bellefonte, Pa. at 8:32 A.M. with burned out generator. The mail was transferred to #192 and left for Cleveland at 9:00 a.m. Encountered very bad weather. Reached Cleveland at 12:15 p.m.
Mail transferred to ship #99 and pilot W. J. Smith left for Bryan, Ohio, at 12:22. He landed at Bryan at 1:10 and left for Chicago after the ship was re-serviced at 1:18. He arrived at Chicago at 3:10 P.M. He had difficulty in finding the field on account of the extremely bad weather conditions prevailing here.

Mail transferred and pilots Hopson and D. C. Smith prepared to depart for Omaha. The weather closed in so tight that it was impossible to get out. Pilot Hopson took off to find out weather conditions aloft. He returned immediately account of impossible flying weather. Waited until 9:00 P.M. for weather to break before mail trained.

Pilot Leonhardt in ship #157 left Hazelhurst Field at 6:04 a few minutes before daylight. He arrived at Bellefonte at 8:10 A.M. The ship was re-serviced and he left for Cleveland at 8:56. Weather conditions were very bad; - heavy fog in the mountains and mist and snow falling. Forced to land 50 miles out of Bellefonte account ice forming on plane weighted it down so that it would not remain in the air. Weather conditions prevailing throughout the day made it inadvisable to fly ship out or send relief plane.

On the other side of the continent, two airplanes headed east; this official account shows the activity of the first eastbound flight (White, 1921, pp. 3, 4):

Pilot Nutter hopped off at Frisco and 4:20 A.M. on the morning of February 22nd, two hours ahead of schedule time and two hours before daylight – D. H. No. 156 was used.

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2 The inconsistencies in abbreviations and punctuation are accurately captured as they appeared in the White (1921) documents. For example A.M. is variously reported as AM, A.M. and a.m.
Nutter in 156 arrived at Reno at 6:45 A.M. The mail was transferred to ship No. 221 and Pilot Eaton left for Elko, Nevada, ten minutes later.

Eaton arrived at Elko at 9:24 A.M. and after the mail was placed in ship No. 152 departed seven minutes later for Salt Lake where he arrived at 11:30 A.M.

Pilot Murray left Salt Lake seven minutes after Eaton arrived using D.H. No. 173. Murray was forced to land at Rawlins forty-five minutes for oil, having attempted a nonstop flight from Salt Lake to Cheyenne. He arrived at Cheyenne 4:57 PM.

The mail was transferred to ship No. 172 and Pilot Yager left at 4:59 PM, arriving at North Platte at 7:48 PM. The last seventy (70) miles were flown in total darkness, the moon being obscured by low hanging clouds. Landing made at North Platte without mishap. Ship No. 172 was re-serviced and Pilot Knight left North Platte for Omaha at 10:44 PM, arriving at the latter point at 1:10 AM. Knight had never flown to Omaha-Chicago run but volunteered to do so. Pilots Hopson and D. C. Smith were scheduled to make the night flight from Omaha to Chicago but were not available on account of being held in Chicago the evening before by extremely bad weather.

Knight left Omaha in Ship No. 188 at 1:59 A.M. The weather was clear at the time of leaving but bad weather was encountered fifty miles west of Iowa City. Knight landed at Iowa City at 4:45 AM. On account of the bad weather encountered at Iowa City and the previous night’s weather report out of Chicago, he waited there for a weather report from the latter point. When word was received that the weather at Chicago was clearing, he left Iowa City. This was a 6:30 A.M. He reached Chicago at 8:40.
The mail was placed in plane No. 85 and Pilot Webster left for Cleveland 20 minutes later. Webster had never flown this route and had never seen the Cleveland Field, being a newcomer in the Mail Service. He reached Cleveland at 12:52 PM.

The mail was placed in two ships here, Pilot Allison leaving in No. 192 at 1:03 and Pilot Hobson in No. 85 at 1:34 pm., it being necessary to reservice No. 85 account the scheduled ship developing motor trouble at the last moment.

Allison landed at Bellefonte at 2:42 PM, for gas and oil, and left for Hazelhurst sixteen minutes later, arriving at the latter place at 4:50 P.M., five minutes ahead of the schedule which had been worked out beforehand.

Hopson made a non-stop flight from Cleveland reaching Hazelhurst at 5:05 PM.

The total time elapsed from the time Nutter hopped off at Frisco to the time Allison landed at Hazelhurst was thirty three (33) hours and fifty-three (53) minutes, taking into account the zone changes in time. The total elapsed flying time was twenty-five (25) hours and twenty-one (21) minutes. The average speed for the entire trip was 103 M.P.H.

This rather droll and factual account did not reflect the excitement being broadcast across the country about this brave airmail pilot, Jack “Skinny” Knight, fighting the winter weather, flying routes he had never flown, and pressing on into the night to get the mail through. When word of his expected arrival time in Chicago was broadcast over the radio, the speakeasies emptied out to greet the arriving hero. So partly by design and mostly by accident, Otto Praeger had his event. Even the incoming President Harding was convinced:
Prodded by President Harding a month after he took office, Congress got busy on laws authorizing Federal regulation of civil aviation and appropriated $1,250,000 for continuing and expanding airmail service and lighting the airways (Taylor, 1962, p. 5).

The Accident

But there was an overlooked event that occurred during this demonstration that demands further explanation. An airmail pilot, William E. Lewis, was killed. Shamburger, in her book Tracks Across the Sky (1964), describes the situation thusly. Pilot Nutter had landed at Reno and,

    glancing over his shoulder, he saw Lewis bank for his final turn prior to landing. Nutter smiled. It had been a close race between them. Then his face tightened in horror. Lewis’ angle of bank was too steep and his approach speed too low for the thin air at the 4,000-foot altitude of the field. Even as the crowd watched, appalled into silence, the plane lost lift and plummeted to earth (p. 75).

Brady (2000) describes it this way, “As Nutter was landing at Reno, he spotted Lewis behind him descending for a landing. Lewis rolled into a turn then lost control. The crash destroyed the airplane and killed Lewis” (p. 132).

Both of these reports were incorrect as to location, flight phase, and most other assertions. Here is the official report of the circumstances for eastbound flight No. 2 (White, 1921, p. 4):

    Pilot Little left Frisco at 4:30 AM, two hours ahead of schedule and two hours before daylight. He was flying DH No. 74 which has had better than 40,000 miles service in the Air Mail.
Little arrived at Reno at 7:00 AM where the mail was transferred to ship No. 221 and pilot Lewis left for Elko ten minutes later where he arrived at 9:30.

The mail was transferred to ship No. 67 and Lewis took off at 9:38. After going about 500 feet alt., on a straightaway climb, he attempted a flat turn and fell into a spin.

The pilot was killed.

It is abundantly clear that the pilot Lewis was killed at Elko, not Reno, and the accident occurred on climb out after takeoff, not on landing. Even the supposed eyewitness, airmail pilot Nutter, was not at Elko when the accident occurred; he was in Reno, having completed his part of the mission.

One should have been able to discern these facts from the accident investigation documents except there was no formal accident investigation. This was in 1921 and the Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) were far into the future. The Post Office made the decisions. Here is a telegram that addresses the question (Tomlinson, 1921 board of inquiry telegram).
Here is Otto Praeger’s response (Praeger, 1921, telegram to Tomlinson):

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Send the following message, subject to the terms
on back hereof, which are hereby agreed to
via radio from Washington via Reno.
Feb. 23, 1921

Tomlinson, Air Mail Service, San Francisco, Calif.

No board of inquiry necessary. Get full statement from manager and witnesses.

Praeger.
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There was no formal accident investigation or Post Office Board of Inquiry. Quite likely Otto Praeger had gotten the attention he needed for the airmail service and drawing attention to the Lewis accident could put a damper on the whole event. It is not unreasonable to conclude that Praeger did not want to highlight the accident and give the media an opportunity to drag the body of a dead airmail pilot into the otherwise jubilant situation.

There was however, a Coroner’s inquiry conducted before a jury by the Elko township Coroner, a Justice of the Peace, on February 23, 1921. It is important to report the testimony as it actually occurred (Doughty, 1921, pp. 2, 3):

E. M. BARBER being first duly sworn., deposes and says:

Q. What is your name?.

A. E.M. Barber.

Q. What is your occupation?.

A. Field Manager of the Postal Aviation Field, Elko Nevada.

Q. Were you in charge of the department February 22, 1921?.

3 Punctuation is shown as reported in the original document.
A. I was.

Q. Tell the jury what you know about the accident to Mr. Lewis.

A. Captain Lewis took off in ship 67, which is one of the mail ships at approximately 9:40 on February 22, 1921. As he started to circle from the field which is the usual procedure, he failed to bank his ship, which resulted in a skid. (Witness explains) In order to sustain flight the relative velocity between the wing section and the air must be maintained at the normal flying speed of the ship. Failure to maintain speed will result in a stall which is usually followed by a tail spin. A tail spin at the altitude which Mr. Lewis was flying (500 ft) will result in the plane striking the ground. The plane and engine was thoroughly tested on the ground before it was turned over to Captain Lewis. Captain Lewis also tried out his engine before taking off. I personally inspected the ship and will vouch for its condition.

Q. Did Captain Lewis have the experience to make successful flights?

A. Captain Lewis was taught to fly in 1916 and has had, according to his log book approximately 500 air hours, which should make him thoroughly capable as a pilot. However, his experience with the mail service, has not been exceptionally meritorious from a standpoint of accurate flying. He has slightly crashed several planes several times during his flying for the mail service which occupies the last two and one-half months. I would say as my personal opinion that I consider him a capable pilot of the average type. This type of accident is a very common one and is perhaps the cause of forty to fifty per cent of the deaths from this type of plane because of their peculiar characteristics I previously mentioned in explaining to the jury. (very heavy nose)
Q. What is your opinion of what caused the accident?.

A. It is my opinion that the accident was due to Captain Lewi’s (sic) management of his plane and not due to any defect in the plane or the engine.

Q. When did this plane get in and from where?

A. This plane was ferried to this field by pilot Blanchfield on February 21, arriving at six P.M. He reported on arriving, that the engine ran smoothly, and no trouble was experienced during his flight. The regular routine of servicing the plane and inspecting was carried out after the arrival and no defects or faults were observed except a slight leak in the radiator which would not have any serious affect on the operation of the ship.

Q. Tell the jury what you know of this man’s personal life.

A. Captain Lewis was born at Canendaigua, New York, on August 19, 1886. He entered the mail service in January 2, 1921, with the following qualifications: Fifteen years full Lieutenant in the United States Naval Reserve; Four years in the United States Aviation Section of the Army; Captain Lewis was single. His mother is alive, Mrs. E.S. Lewis, residing (sic) at 6356 Greenwood Ave., Chicago, Ill. Regarding his general habits, he was considered a very quiet and unobtrusive man and was particularly interested in theology. He was not addicted to the use of intoxicating liquor or tobacco. His relations with the men of the field have been entirely of a friendly nature, and he was more or less quiet and kept to himself and he tended strictly to business and there was no one on the field who had a grudge (sic) against him that might be considered of a personal nature.
This Coroner’s jury was the sum total of the aircraft accident investigation. Only one witness was called, no other witnesses were interviewed, and there was no independent analysis of the crash site to determine airframe, engine, or flight control issues that might have contributed to the accident. In a letter to the Regional Superintendent in Reno, Barber explained in more detail his version of the accident. He stated that the pilot Blanchfield who had ferried ship No. 67 to Elko reported that “the ship ran well and….The ship is rather loggy and heavy on the controls” (p. 1). The maintenance crew checked the ship over, put in warm oil and warm water and started the engine. They warmed the engine, checked the switches, and shut the engine down until they saw Lewis approach. They then started the engine again and others loaded the mail from Lewis’ ship to this one. Lewis climbed aboard then opened the throttle, tried both switches, and signaled to pull the blocks. He then took off down the field, (west) and flew in a straight course for a distance (estimated) of 1 ½ miles rising to an altitude of 500 ft. He then went into his first turn, turning south, leveling slightly and continued his turn toward the east.

In turning, it is the opinion of all witnesses including the following men: Geo. Meredith, Chief Mechanic, Don. C. McCormick and Carl Hamilton radio operator that Lewis did not bank his ship sufficiently. In other words, he attempted to execute a flat turn. The ship lost speed instantly, the nose dropped and went into a power spin with the nose pointed almost vertically. The ship struck directly on its nose tearing the engine and gasoline tanks loose.
Examination of the plane showed the following things. Both switches were on. The throttle was about ¾ open however the rod was bent and it is probable that it was not in that position when the plane struck (Barber, pp. 1, 2).

Barber, as the field manager, was responsible for the airworthiness of the airplane therefore his testimony could be viewed as self-serving. The other witnesses cited in Barber’s letter were maintenance technicians who prepared the airplane; they were not pilots. Perhaps they were qualified to judge Lewis’ piloting actions and perhaps not. Except for the ferry pilot Blanchfield’s statement that the airplane was “loggy and heavy on the controls”, there was no statement from a pilot. Blanchfield’s statement brings up the notion that the airplane may have had a flight control problem, but this was not explored further. Rather, by both his testimony and his letter, Barber placed the blame directly on Lewis. Accordingly, it seems reasonable to examine Lewis’ background.

The Pilot

He was born William Ernst Lewis and listed his age as 35 years on his application to the Aerial Mail Service completed in January 1921 (Aerial Mail Service, Lewis application, 1921). This would make his birth year 1886. However, this does not jibe with his Navy service records that list his birthday as August 19, 1876 (U.S. Navy Form 4-1625, 1912, p. 2). Clearly he misstated his age on his application to the Post Office for an airmail pilot position. Rather than being 35 years of age, he was 45.

Regarding his military career, he was a member of the Naval reserve and served a short time in the active-duty Navy as a Seaman. As his pay records indicate, he later joined the Army in the summer of 1917 and was sent to Chanute Field in Rantoul, Illinois for pilot training (U.S.

Lewis flew several aircraft types in the Army Air Service. On his airmail pilot application, the question is asked about the types of aircraft flown; among others, he listed the Curtiss Flying Boat, R-9 (Aerial Mail Service, Lewis application, 1921). It seems odd for an Army unit to be equipped with seaplanes but that was indeed the case, as pointed out in the history of the 6th Aero Squadron (Ford Island History). Included among the aircraft flown during his Army service, Lewis listed the DH-4. A check of the history of the 6th Aero Squadron on Ford Island confirmed that the 6th was equipped with DH-4s during the period that Lewis served (Ford Island History). This important point supports Lewis' claim that he was qualified to fly the DH-4 aircraft prior to joining the air mail service.

In Barber's testimony before the Coroner's jury, when referring to Lewis' capabilities as a pilot stated that, "his experience with the mail service, has not been exceptionally meritorious from a standpoint of accurate flying. He has slightly crashed several planes several times during his flying for the mail service which occupies the last two and one-half months" (Doughty, 1921, p. 2). This statement implies two points: (1) Lewis was not a proficient pilot and (2) slightly crashing several planes in two and half months is atypical. Both of these points can be challenged with data.
Point 1. Lewis was not a proficient pilot.

At the record to the right shows, since joining the airmail service in early January 1921, Lewis had flown the DH-4 aircraft for more than 95 hours (Air Mail Service. *Air time of Pilot Lewis (1921)*). That's a substantial amount of flying time for less than a two month period even by today's standards. Conclusion: Because of both the quantity of flight time and the recent period in which it was earned, it is easy to conclude that Lewis was a proficient pilot in the DH-4 aircraft.

Point 2. Slightly crashing several planes in two and half months is atypical.

Airmail statistics show that over an eight month period beginning in August 1919 and ending in March 1920, twenty airmail pilots experienced more than 200 forced landings. An airmail pilot during this time period had a one in five chance of having to execute a forced landing every time they flew (Post Office Department, March 25, 1920). In this Post Office document there is a column entitled "Trips Completed Without Forced Landings." Plainly the forced landing was such a common occurrence that it was tracked as a separate statistic. By this measure, Lewis, in his thirty-five flights, could have made seven forced landings without anyone raising an eyebrow at headquarters. In looking at the data, it appears (not conclusive)
that Lewis had three, one each on January 10th, 12th and 22nd. To the extent that forced landings can be equated to *slightly crashing an airplane*, it is easy to conclude that when Barber inferred that Lewis was somehow atypical of other airmail pilots, he was doing so without support from the data. To be fair, later in his testimony Barber said that Lewis was average but the damage was done; he had already pointed the damming finger at Lewis.

Interestingly, Lewis' information was not included in the March 25, 1920, Post Office document. By the time the report was published, Lewis had suffered the fatal accident and there was no column for "Pilot Fatalities" in the document. Other documents of the period however did address pilot fatalities. Over the 1920-21 period, 17 airmail pilots lost their lives (Air Mail Service., *Statistics*, 1918-1928). Given that the March 20, 1920, report showing 20 pilots in airmail service, the loss represents an attrition of 85% over the two year period.

Of those seventeen pilots who lost their lives, a study of the records yields the following causal statistics: four of the accidents were due to weather problems, four to mechanical issues, six to pilot error, and two unknown. These causal factors were not assigned by the Post Office authorities at the time of the accidents but were determined by the author by examining each of the brief reports (Sutherin, 1925). These accidents which are in the table that follows, were arranged by author-assigned event number, date, causal factor (P-Pilot, M-Mechanical, W-Weather, U-Unknown), and event description (Sutherin, 1925):

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4 Modern accident investigation teams using modern methods and techniques and having access to each accident site, records of the flight, engine teardown information, structural examination and so on would most likely produce different and more detailed causal factors.
### Table 1

**Fatalities in the Air Mail Service, 1920 and 1921**

<table>
<thead>
<tr>
<th>Event Number</th>
<th>Date</th>
<th>Aircraft Type</th>
<th>Causal Factor</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>March 10, 1920</td>
<td>De Havilland DH-4</td>
<td>W</td>
<td>Flying between Chicago and Cleveland. Ran into tree in fog. Plane caught fire when it crashed; pilot instantly killed.</td>
</tr>
<tr>
<td>2</td>
<td>March 30, 1920</td>
<td>DH-4</td>
<td>P</td>
<td>In landing at Heller Field, Newark, N.J. ran into smoke stack on factory near field and crashed into ground. Pilot killed.</td>
</tr>
<tr>
<td>3</td>
<td>April 10, 1920</td>
<td>Curtiss R-4</td>
<td>M</td>
<td>Passenger (airmail pilot) was in the plane being ferried from Bustleton to Newark by another airmail pilot. Plane caught fire in air and passenger jumped or fell from plane at altitude of 200 ft. Fatally injured.</td>
</tr>
<tr>
<td>4</td>
<td>August 16, 1920</td>
<td>DH-4</td>
<td>W</td>
<td>While practicing landings at College Park, Md., struck radio mast in rain and crashed to ground. Pilot thrown from plane and plane caught fire from burning gasoline. Fatally injured.</td>
</tr>
<tr>
<td>5</td>
<td>September 1, 1920</td>
<td>Junkers JL-6</td>
<td>M</td>
<td>Flying between New York and Cleveland. Ship caught fire in air and crashed to ground. Pilot and mechanic both instantly killed.</td>
</tr>
<tr>
<td>6</td>
<td>September 14, 1920</td>
<td>Junkers JL-6</td>
<td>P</td>
<td>Flying between Cleveland and Chicago; plane caught fire in air; landed safely but exploded when landing; pilot and mechanic killed.</td>
</tr>
<tr>
<td>8</td>
<td>October 16, 1920</td>
<td>DH-4</td>
<td>W</td>
<td>Flying between Chicago and Omaha. Landed in fog: crashed and caught fire. Pilot instantly killed.</td>
</tr>
<tr>
<td>Event</td>
<td>Date</td>
<td>Aircraft</td>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>----------</td>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>9</td>
<td>November 6, 1920</td>
<td>DH-4</td>
<td>W</td>
<td>Flying between Salt Lake and Cheyenne, ran into fog and snow storm and hit side of hill. Pilot instantly killed.</td>
</tr>
<tr>
<td>10</td>
<td>February 3, 1921</td>
<td>DH - Twin</td>
<td>M, P</td>
<td>Flying twin DH, one motor cut out and in looking for a field, stalled plane. Killed</td>
</tr>
<tr>
<td>11 &amp; 12</td>
<td>February 9, 1921 (two pilots)</td>
<td>Junkers JL-6</td>
<td>U</td>
<td>Flying from Lone Rock, Wis., crashed at LaCrosse field cause unknown. One pilot was flying, the other was learning the route.</td>
</tr>
<tr>
<td>13</td>
<td>February 22, 1921</td>
<td>DH-4</td>
<td>P</td>
<td>Flying between Elko and Salt Lake; stalled plane on takeoff at Elko. Plane crashed and pilot killed. <em>(This was the Lewis flight.)</em></td>
</tr>
<tr>
<td>14</td>
<td>April 22, 1921</td>
<td>DH-4</td>
<td>P</td>
<td>Flying New York to Cleveland. Landed Mitchell Field. In attempting takeoff went into vertical bank; ship crashed, took fire. Pilot badly burned and died April 30, 1921.</td>
</tr>
<tr>
<td>15</td>
<td>April 29, 1921</td>
<td>Not stated, presumably a DH-4</td>
<td>M</td>
<td>Flying Chicago to Cleve. Motor cut out and in attempt to land (Cleveland-Cayhoga River) hit concrete abutment (sic). Ship completely burned and pilot killed.</td>
</tr>
<tr>
<td>16</td>
<td>May 5, 1921</td>
<td>DH-4</td>
<td>P</td>
<td>Attempting to land at Rock Springs made nose dive; plane crashed, catching fire, and completely demolished. Mail destroyed. Pilot burned beyond recognition.</td>
</tr>
<tr>
<td>17</td>
<td>July 6, 1921</td>
<td>DH-4</td>
<td>P</td>
<td>Attempting to leave Marina Field, altitude 300 ft., ship nosed down and burst into flames as it hit the ground at 4:25 p.m. Plane a total loss, 5 pouches mail destroyed.</td>
</tr>
</tbody>
</table>

Event number 13 is the Lewis flight. The report states that the pilot stalled the plane on takeoff, yet the coroner’s report states that the aircraft was approximately 500 feet. It would have been more understandable had the accident occurred on takeoff, but it did not. The pilot
had climbed the DH-4 to 500 feet had made one turn of approximately 90 degrees and was attempting to make another 90-degree turn when the airplane departed from controlled flight. How likely is it that a pilot stalls the aircraft after climbing to 500 feet, making one turn and starting another?

**Comparing Modern Accident Data**

To answer this question, modern aircraft accident data were examined. Two sets of data were studied: 1998 and 2001 (NTSB, 2012). These years were chosen based upon the ease of accessibility of information. The data which were examined were of general aviation (GA) accidents in each of the two years. It was reasoned that modern GA aircraft matched more closely with the DH-4 than a modern-day, large commercial aircraft used to deliver the mail.

There were 1,929 GA accidents in 1998 and 1,749 in 2001. The files for each of the year sets were each sorted by the following parameters: VMC only; single engine only; airplane only (e.g., no balloons, helicopters); no amateur-built airplanes; only those accidents that occurred on takeoff-initial climb, climb, or climb to cruise; and finally those in which the first occurrence was loss of control. Once the sort factors were applied, the 1998 group produced 52 accidents and the 2001 group produced 36. The accident narrative for each of these 88 accidents was closely examined to determine similarities to the Lewis accident of 1921. This yielded one accident in each year group for further analysis. After some discussion with staff in the NTSB, the accident reports for these two accidents were added to the docket which then enabled the researcher to have access to the information (NTSB, 2012 Docket).

Of these two accidents, one was the result of improper aircraft configuration for takeoff on a Cessna 172 (pitot heat was on and flaps set at ¾ down). The airplane stalled at about 200
feet. The second aircraft was a PT-19 which stalled shortly after takeoff because the pilot failed to maintain proper airspeed. While both of these accidents appeared similar to the Lewis accident, in fact, upon close examination, neither was similar. Neither reached 500 feet, and neither stalled while trying to make a departure turn. The upshot of this analysis is that out of 3,678 accidents over a two-year, non-consecutive period, there were no accidents that were similar to the Lewis accident. A conclusion that one can draw is that the accident as described in the Coroner’s Jury was as unlikely in 1921 as it was in 1998 or 2001. Something else most likely happened that contributed to Lewis’ loss of control. That information, whatever it might have been, could have been immensely valuable.

If we take another look at Table 1, we see there is one other similar DH-4 accident that occurred exactly a month later (April 22, 1921). The report states, “In attempting take off went into vertical bank; ship crashed, took fire” (Sutherin, p. 3). The record does not indicate whether or not there was a mechanical malfunction, or engine problem, or pilot problem, or one of a dozen other possibilities. Perhaps if the Lewis accident one month earlier had been fully investigated, this one could have been prevented.

**Student Investigation**

To attempt to accomplish an accident investigation that should have occurred in 1921, a student group in an undergraduate college class in aircraft accident investigation was asked to conduct a mock aircraft accident investigation of the Lewis accident. They were provided all of the documents and material contained in the bibliography of this paper. Many of these documents were scanned from records in the National Archives and Records Administration, Washington D.C., the U. S. Postal Museum in Washington D.C., the National Air and Space
Museum, Steven F. Udvar-Hazy Center in Washington Dulles, and the National Personnel Records Center, St. Louis, MO. The student investigation team produced the following findings (Garver et. al, 2012, p. 14):

- The aircraft was structurally not safe for flight operations.
- It was likely that no proper instrumentation was available in the cockpits of the aircraft in use.
- Given the information available, it is nearly impossible to assess the performance of the aircraft’s structure and restraint systems in terms of protecting the occupants.
- Based on calculations using the available information and assumptions, the horizontal deceleration was likely at, or just slightly below, the lethal threshold. However, the vertical deceleration was likely over 100 times the acceptable human tolerance. Therefore, this accident can clearly be considered non-survivable.
- Lack of information makes it difficult to assess environmental and post-crash factors. However, given the magnitude of the declarative forces, it is extremely unlikely that the pilot was not killed instantly, rendering any environmental and post-crash factors irrelevant.
- No performance limitations were specified for the airplane by the Federal Airmail Service (FAS).
- No proper documentation was kept until the close of the financial year 1922.

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5 A copy of the complete student accident investigation report and the archival documents shown on the references page in this paper can be accessed at the following google docs location: https://docs.google.com/folder/d/0BxDpepR869cbX3hiN3FqYVkyMjg/edit?usp=sharing
• Pilots flew to airports they had never been before. These flights typically occurred without any proper preparation or guidance.
• Even though flying at low altitude involved high risk, it was considered a normal and necessary procedure.
• The reported radiator leak was considered normal.
• The culture present within the FAS at the time of the accident was not conducive to the safe operation of any flight.
• Complaints from airmen in the FAS indicated that the aircraft were poor in maneuvering and had a tendency to enter a “tail spin” once an aerodynamic stall occurs.

The student team also determined that the probable cause of the Lewis accident was as follows (Garvey, p. 15):

This investigation team has determined, based on the limited information available, the probable cause of this accident to be as follows: The pilot’s failure to maintain the necessary airspeed needed to maintain flight. Contributing to the accident were: (1) The poor flight characteristics of the Dayton-Wright DH-4B. (2) The inadequate documentation on the part of the FAS in terms of airplane operating limits. (3) The FAS’s allowance of the aircraft to be operated outside operating limits. (4) The FAS’s inadequate procedures and standards relating to the maintenance and inspection of air worthiness of its fleet.
The Dignity of an Investigation

The purpose of an aircraft accident investigation at its core is to determine the truth of what happened so that the real problems relating to the accident are solved with real solutions. But an accident investigation is more than that. It accords the parties involved in the accident the solemnity of a fair examination of the facts and a thoughtful, respectful determination of the causes. Until now airmail pilot Captain William E. Lewis had not been provided the dignity of an accident investigation. It is hoped that this report fulfills that basic obligation of the aviation community.

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