The History of the Twentieth Century
Episode 326
"War in the Air"
Transcript

[music: Fanfare]

During the First World War, airplanes went from novelty to crucial component of an advanced military.

Between the wars, aviation technology saw major advances.

What does that mean for the Second World War?

Welcome to *The History of the Twentieth Century*.

[music: Opening War Theme]

Episode 326. War in the Air.

The Second World War has been going on for ten months now, and the story of the war so far has been a series of surprises orchestrated by Germany, beginning with the rapid collapse of Poland, then an unexpected occupation of Denmark and Norway, then a western offensive that overran the Netherlands and Belgium with astonishing rapidity, and culminating with the biggest shock of all, defeat and occupation of France in a matter of weeks.

The capitulation of France left the United Kingdom as the only European nation left standing against Nazi Germany. After nearly a year of watching other nations fall like dominoes, observers of the time could be forgiven for thinking Britain would be defeated and under German occupation by, like, October. And in 1940, many people thought exactly that.

On the other hand, there is the one crucial and obvious geographical fact that distinguishes Britain from other European countries: Great Britain is an island. Invading and occupying Britain is a very different proposition from invading and occupying France. On the other other hand, Germany invaded and occupied Norway, despite the absence of a land link between the two countries and despite the opposition of the Royal Navy.

German military operations so far have included clever and innovative use of air power, including transporting soldiers by air and dropping them on enemy positions by parachute and

glider. The Germans captured positions in Norway that way. They neutralized Belgium's strongest fortification that way. Is it any wonder that by July 1940, Britons were looking nervously to the sky, wondering when the first parachutes would appear?

To understand this next phase of the war, we have to take a closer look at developments in aviation since the Great War and understand the aircraft of 1940, and this story begins with the biplane. The Wright Brothers' first aircraft, the one they flew at Kitty Hawk in 1903, was a biplane. Most of the aircraft involved in the Great War were biplanes. At the outbreak of the Second World War, many nations still had biplanes serving in their air forces, including Germany and Britain. Even so, by this time the biplane was definitely on its way out. When you think of air warfare during the First World War, you picture biplanes, but when you think of air warfare during the Second World War, you picture monoplanes. What happened?

The wings of an airplane provide the lift that keeps it in the air: the larger the wings, the greater the lift. The rest of the airplane is essentially hanging from the wings, which hold it aloft. The ideal aircraft wing therefore has a large surface area, to provide lots of lift, and is also lightweight, because every pound or kilogram of additional weight in the wing is that much less weight allowance for the fuselage. This is the reason that the earliest airplanes had wings made of wood and fabric: they needed to be as light as possible.

A larger wing provides more lift, but it also requires more support structure to hold it together. So for example, if you doubled the size of a wing, you'd double the lift, but the structure of the wing would weigh more than double, because it would now need additional reinforcement to hold it together. This means that larger wings yield a diminishing return in lift. Instead of doubling the size of the two wings on your aircraft, you will get a better return if you double the number of wings and attach four of them instead of two.

Now, the two sets of wings on a biplane still do not provide twice the lift of one set, because the airflow around each wing is disturbed somewhat by the presence of the other. But you still get a sufficient increase in lift to make the extra pair of wings worth the cost. And there's an added bonus: you can attach wires and struts between the wings. These reinforce both wings and make each of them stronger than it would be on its own.

And what I've just described is the classic World War One fighter biplane, with two pairs of wings bound together with struts and wires, and biplanes remained the most common airplane design for nearly a decade after the war.

The engines of these early airplanes were not very powerful. This was why maximizing lift and minimizing weight were so important. Airplanes of this time were powered by internal combustion engines, just like automobiles. The push to develop more efficient engines was driven more by the automotive industry than the aviation industry, but aviation certainly benefited. Higher octane fuels allowed for more powerful engines, as I discussed back in episode 250.

A more powerful engine in your car is nice; a more powerful engine in your airplane is revolutionary. That's because greater engine power in an airplane means not only a faster plane. It means air moves faster over the wings and thus increases the lift, and greater lift means that wing area is less important. You can lift the same weight with smaller wings.

On the one hand, that reduces the advantage you get from a second pair of wings. On the other hand, these smaller wings have to support more fuselage weight, so light materials like wood and cloth are out. Newer airplane wings have to be made of metal, and the metal of choice for its attractive combination of strength and light weight was aluminum, or *aluminium,* as our British friends like to say.

Aluminum is a common element in the earth's crust, but it is difficult to isolate in a pure form. In the early 19th century, British chemist Sir Humphry Davy first extracted aluminum by electrolysis and gave it its name. Chemists recognized early on that aluminum combined strength with light weight, making it potentially valuable in many applications, if only an economical way could be found to produce it in quantity. Improved methods were developed in the 1890s, and by the beginning of the twentieth century, aluminum began to appear in consumer products, most notably in cookware, as aluminum pots and pans began to replace much heavier cast iron and aluminum foil was introduced. By the Jazz Age, aluminum was available at an economical price and was much in demand for aircraft construction.

A higher aircraft speed means more lift from the wings, but it also means more drag. Any protrusion from the airplane that interferes with the smooth flow of air will inhibit forward motion and cost you some of the benefit you get from your high-powered engine. In particular, those wires and struts that hold together the paired wings of a biplane create a lot of drag and are just not suitable for faster aircraft.

So, bye-bye, biplane. You had a good run, but a new day is dawning. By the 1930s, metal airplanes made of aluminum and featuring smooth aerodynamic surfaces became standard. But early monoplanes still had a few struts to help bind the wings to the fuselage. Fewer, smaller struts, yes, but still sources of drag. From an aerodynamic point of view, the ideal wing is cantilevered; in other words, there is no external bracing. To achieve this, you need to have a rigid support that runs the length of the wing, known as a spar. Each wing spar needs to be attached to the fuselage and to the other wing's spar. For this reason, it is easier to design an airplane with wings above or below the fuselage, so that the wings are attached to each other above the fuselage, and the fuselage hangs below, or else below the fuselage and the fuselage sits on the spars. You can attach the wings at the middle of the fuselage, but this will require the spars to run smack through the fuselage, which reduces the usable space. For this reason, aircraft of this period almost always have wings above or below the fuselage.

Once you've begun using cantilevered wings, you'll quickly find that the next most significant source of drag on your aircraft, now that you've eliminated those pesky external wing struts, is

the landing gear. Aircraft need wheels underneath to taxi, take off, and land, but they do no good in the air and they produce drag. There is a solution to this problem, but it's complicated. You need retractable landing gear that can be withdrawn into the body of the plane while it's flying, but can be extended again when they are needed to land. Of course, they also have to be sturdy enough to support the weight of the plane.

One of the first modern monoplane fighters was the Boeing P-26 Peashooter, which I mentioned back in episode 301 in connection with the Chinese air force. Introduced in 1932, the P-26 was an all-metal monoplane, though it still had external struts on the wings and fixed landing gear, though the landing gear were fitted with aerodynamic covers vaguely reminiscent of spats. The P-26 also had an open cockpit, and that too, is a source of drag.

A year later, in 1933, the Soviet Air Force began flying the I-16, designed by Nikolai Nikolaevich Polikarpov. The I-16 was also an all-metal monoplane, with a canopy to cover the cockpit and landing gear that the pilot could retract by turning a crank. This plane saw service in the Spanish Civil War on the Republican side, where it proved superior to German fighters of the time, until the introduction of the Messerschmitt 109.

[music: Holst, *Terzetto*]

When the United States entered the First World War, the US government purchased thousands of airplanes from the Curtiss Aeroplane Company. These were two-seater biplanes with dual controls and were used to train pilots. The company designated these planes as the JN series, and they were quickly nicknamed the "Jenny."

But, as longtime listeners know, the war ended before the US was able to develop much of an air force. The end of the war left the US with thousands of trained pilots, many of whom had caught the "bug" and now had no airplane to fly, as well as thousands of war-surplus Curtis Jennies. The government sold off these surplus planes, often for pennies on the dollar. Many were purchased by ex-military pilots as well as by other people intrigued by airplanes.

Airplanes were a new technology, and this was the first time there were large numbers of civilian airplanes and pilots out loose in the world. Government regulation of aircraft and pilots barely existed; it was like the Wild West, so if you were a pilot in the America of 1920 who owned your own Curtiss Jenny, you could do practically anything you wanted with it. So what might you want to do? More to the point, how might you earn an income from your airplane and your flying skills?

Business opportunities were limited. You might find work transporting mail for the US Post Office. You might get paid to apply agricultural chemicals to farmers' fields from the air, a job known as "crop dusting." The US Department of Agriculture began experimental crop dusting in 1921using a modified Curtiss Jenny. Commercial crop dusting began in the US in 1924.

If you had a flexible attitude toward the law, you might try smuggling liquor into the United States by air from Canada or Mexico during Prohibition, which could be lucrative, so long as you didn't get caught.

This handful of niche career possibilities wasn't nearly enough to provide work for all the pilots and planes in Roaring Twenties America, so what did the rest of them do? They became entertainers, traveling the country to appear at county fairs and similar events. Often they simply appeared unannounced at some small rural community, buzzing the local town to attract attention, then renting a field from a farmer, where they would offer rides in their airplane, for a price, or else perform stunts in front of a paying audience.

This form of entertainment became known as barnstorming. The term "barnstorming" already existed in American English to describe entertainers, public speakers, or exhibition sports teams that traveled through rural America, but by the Roaring Twenties, barnstorming mostly meant exhibition flying. Barnstorming pilots would race each other or perform stunts, such as spins, dives, loops, and rolls. Since there were no regulations, there were no barriers. As long as you could get your hands on a plane and learn to fly it, you were in. Thus, some of these barnstormers were women, like Katherine Stinson, born in Alabama, who became one of the first women pilots. She flew in exhibitions, including becoming the first woman to fly an airplane in Canada, and again in Japan. She opened a flight school where her sister Marjorie helped teach.

And then there's Bessie Coleman, born in Texas to a family that was part African-American and part Cherokee, making her likely the first Black person and the first indigenous person to fly an airplane.

Daredevil aviators became one of the many fads of Jazz Age America, right alongside pole sitting and dance marathons. With so many flyers competing for attention, you had to do something special to stand out. Everyone was under pressure to perform increasingly spectacular stunts, which were also riskier. Some flyers formed teams, called "flying circuses." Pilots took on parachutists to jump out of planes, or wing walkers who would walk out onto the wing of an airplane in flight. More ambitious wing walkers would take a chair along and sit on it on the wing, or dance or do gymnastics or even leap from the wing of one airplane to another. The bravest took the notion of "barnstorming" literally and flew their planes through a barn, in one door and out the door on the other side.

Predictably, as stunt pilots attempted more daring stunts, crashes and deaths became more common. In 1926, Congress passed the Air Commerce Act, which empowered Herbert Hoover's Department of Commerce to license aircraft and pilots and set safety regulations. Safety regulations meant the end of barnstorming.

One pilot who got his start in barnstorming was Charles Lindbergh. His father, who had the same name, was an immigrant from Sweden who represented a district in Minnesota in the US Congress. The younger Lindbergh quit the University of Wisconsin in his sophomore year after

catching the flying bug. In 1922, at the age of twenty, Lindbergh took a job wing walking and parachute jumping. In 1923, he got his own plane and became a barnstormer. The following year he joined the US Army Air Service, took flight training, graduated first in his class, and was commissioned a lieutenant in the US Army Reserve. The year after that, he got a job flying air mail for the Post Office out of St. Louis.

I'm sure you already know where this story is going. In 1919, two British aviators named John Alcock and Arthur Brown flew the first transatlantic flight, from St. John's, Newfoundland to Clifden, Ireland, winning themselves a £10,000 prize from Lord Northcliffe's *Daily Mail*. French-born New York hotelier Raymond Orteig then offered a $25,000 prize for the first nonstop transatlantic flight from New York to Paris. Several pilots died in attempts to win the prize, which was still unclaimed in 1927, when Charles Lindbergh took a crack at it.

He got financing from a couple of St. Louis businessmen to commission a custom-built monoplane, dubbed *The Spirit of St. Louis*, and in May 1927, at the age of 25, he flew the plane solo from Roosevelt Field on Long Island to Le Bourget Airport outside Paris.

I've touched upon Lindbergh and his transatlantic flight briefly a couple of times before on the podcast, in episodes 238 and 274, and a few listeners have asked me why I haven't paid more attention to this event. Frankly, it's because I have a hard time understanding why this was such a big deal. Alcock and Brown had already demonstrated that transatlantic flight was possible eight years earlier. Lindbergh's flight was a bit longer, but otherwise only different in that it was a solo flight, meaning he had to stay awake for the full 33½ hours it took, which is not all that difficult for a healthy 25-year-old, although Lindbergh didn't do himself any favors the night before, when he was too excited to get more than a couple of hours sleep. He reported nodding off as early as the afternoon of the first day and probably did fall asleep at the controls a few times, but did not crash, fortunately for him.

But the public of the time thought this was a big freaking deal. Upon his arrival in France, he was mobbed by a crowd estimated at more than 100,000. He was received by the Kings of Belgium and Britain before returning to a hero's welcome in the United States. Congress passed a special act awarding him the Medal of Honor, which is normally only given for heroism in combat. That seems like overkill. He got a ticker tape parade in Manhattan. St. Louis named a boulevard after him. My home town of Reading, Pennsylvania named a viaduct after him. Multiple airports are named after him. He published an autobiography—a 25-year-old writes his autobiography—and the US Post Office issued an air mail stamp with an image of *The Spirit of St Louis* and a map of Lindbergh's route. *Time* magazine named him its first "Man of the Year."

It must have been something about the times. The barnstormers had attracted public attention, a new generation of monoplanes with more powerful engines was appearing, and commercial passenger travel by air was just getting off the ground, so all those developments no doubt

contributed. Whatever it was, there was suddenly a lot more interest in civilian aviation, and other pilots were inspired by Lindbergh's example to attempt some firsts of their own.

One such pilot was Wiley Post, born in Texas to a family that was part European and part Cherokee in ancestry. Like Lindbergh, Post started as a parachutist before graduating to pilot. In 1929, the German airship *Graf Zeppelin* gained attention by circumnavigating the world in 21 days. In 1931, Post and his navigator, Australian Harold Gatty, flew around the world in just under nine days. Post repeated this feat in 1933, this time flying solo and shaving a day off his time.

Alas, airplanes of this time were less reliable and more dangerous even for experienced pilots. Post became interested in the possibilities of passenger service from the West Coast of the United States to Russia via Alaska. Post was friends with humorist Will Rogers, and in 1935, Rogers asked Post to fly him across Alaska as material for his newspaper column. Post flew the airplane while Rogers wrote his columns on a typewriter. Unfortunately, their plane crashed near Point Barrow, the northernmost tip of Alaska, on August 15, killing both of them.

And then there's the case of the most famous woman aviator of the era, Amelia Earhart. In 1928, a year after Lindbergh's flight, Earhart became the first woman to fly across the Atlantic Ocean, with the caveat that although she was by this time already an experienced pilot, she did not pilot the aircraft on this occasion. No matter, she became a celebrity anyway. They called her "Lady Lindy," as in, the female Charles Lindbergh. Earhart wrote a book, did celebrity product endorsements, and went on a speaking tour, all to raise money for future flights and to promote women in aviation.

In 1929, she competed in the first Women's Air Derby, an all-women aerial race from Santa Monica, California to Cleveland, Ohio. She came in third. Will Rogers dubbed the event the "Powder Puff Derby," and the name stuck. In 1931, she married publisher George Putnam but, unusually for the time, kept her maiden name and continued to be known as Amelia Earhart.

In 1932, she flew solo from Newfoundland to Northern Ireland in 15 hours, becoming the first woman to fly a solo transatlantic flight. She became the first person to fly solo from Hawaii to California and by 1937, had racked up a number of women's speed and distance aviation records.

In 1937, she attempted to become the first woman to circumnavigate the world, as part of a two-person crew that would include a navigator. Now, Wiley Post had already done this, but Earhart intended hers to be a longer flight that would follow a mostly equatorial route. Her first attempt began in Oakland. She flew to Hawaii without incident, but when she attempted takeoff from Hawaii, the landing gear of her plane collapsed, doing the aircraft significant damage.

It had to be repaired, and later in 1937, she made a second attempt, also beginning at Oakland, but this time headed east, to Miami, then south along the coast of South America to Brazil, then across the Atlantic, Africa, and India, and through the East Indies.

On July 2, Earhart and her navigator, Fred Noonan, took off from Lae, New Guinea, headed for Howland Island, an uninhabited island claimed by the United States that lies about halfway between New Guinea and Hawaii. She planned then to fly from Howland Island to Hawaii and then to Oakland to complete the flight.

But she and Fred Noonan never arrived at Howland Island. A US Coast Guard cutter *Itasca* was at the island to communicate with Earhart and help her and Noonan navigate. Unfortunately, although *Itasca* received radio transmissions from Earhart, she complained that she wasn't receiving transmissions from the cutter and was running low on fuel. Her radio signal was strong enough that the crew of the boat was convinced she was nearby. The cutter put out a column of smoke to help her find the island, but she never arrived. The Navy searched for her for seven days, the most intensive and expensive search and rescue operation in its history, up to that time. Afterward, Earhart's husband financed his own search, but no trace of Earhart or Noonan or their aircraft has ever been found, and the disappearance of Amelia Earhart and Fred Noonan remains the most famous missing-persons case of all time.

[music: Holst, *Terzetto*]

Shortly after Adolf Hitler became the German chancellor in 1933, his government created an aviation ministry. Hermann Göring was appointed aviation minister. The Treaty of Versailles prohibited Germany from having an air force, so the story was that the aviation ministry would oversee civilian aviation in Germany, including the development of new and better airplanes. It did, but the ministry's technical department also secretly began work on researching and developing military aircraft as a part of German rearmament.

Since the aviation ministry was building an air force from the ground up, it had to begin by developing theories of how and where military aircraft would be employed in a future war. The technical department came up with a list of four broad categories of aircraft: a medium bomber, a tactical bomber, a heavy fighter, and a single-engine fighter. German aircraft companies were invited to compete in submitting designs in each of these categories, with the winning designs to be put into production.

In the medium bomber category, no clear winner emerged. At least three different designs were put into production, including the Junkers-86 and the Dornier-17, but by the time the war began, the best-known and most numerous German bomber was the Heinkel-111, a twin-engine plane originally presented as a newer, more modern passenger aircraft, though everyone involved in its development knew they were really working on a bomber.

The He-111 has a distinctive glass nose. The pilot, navigator, and bombardier or forward gunner all look through the expanse of glass and benefit from the wide visibility it offers. It carried a crew of five, had a maximum speed of about 400 km/h and a range of more than 2,000 kilometers. Its ceiling of 6,500 meters put it out of reach of most fighter aircraft, which couldn't climb that high.

On the other hand, dropping bombs out of an aircraft that's flying four miles above the ground is not a formula for precision. Bombers like the He-111 were not capable of pinpoint strikes on a building, or even a neighborhood. If your bomb landed in the right city, you were doing pretty well. Precision work required a tactical bomber, and Germany's most famous tactical bomber of this era was the Junkers-87, known as a Stuka. Stuka is a shortened form of the German word for dive bomber, *Sturzkampfflugzeug*.

The Stuka was a single-engine bomber with a two-person crew. Unlike the He-111, which was designed to soar at an altitude that put it out of reach of enemy fighters and anti-aircraft guns on the ground, the Ju-87 was designed to get down and dirty. It was a dive bomber. The pilot would identify a target on the ground. When the bomber got close to the target, the pilot rolled the plane until it was inverted, which caused it to dive nearly straight down toward the target at high speed. At an altitude of about 500 meters, the plane released the bomb and pulled into a steep climb, while the bomb continued to drop at high speed toward the target.

This allowed the Ju-87 to deliver its bombs with a precision that the crews of a high-altitude bomber could only dream of. The Ju-87 was accurate enough to hit targets as small as a ship or a bridge. This procedure is rough on the crew, though. Pulling out of the dive subjects the crew to as much as six *g*s of acceleration: in other words, the equivalent of six times the Earth's gravity. This much g-force drains the blood out of the pilot's head, which impairs vision and can cause a brief loss of consciousness. To deal with this, the Ju-87 had an innovative control system which would insure the plane would pull out of its dive automatically, even if the pilot blacked out.

The Stuka first went into combat in Spain during the civil war there, but it really made a name for itself in the war against Poland. More than 300 Stukas participated in that battle. These were the planes that bombed the Polish town of Wieluń on the first day of the war. Troop trains were easy targets for dive bombers; in one instance, a Stuka attack wiped out a Polish infantry division as it was debarking from its train. Entrenched Polish infantry units proved to be sitting ducks for Stuka attacks from above; this was an early indication that World War II was going to be very different from the first war.

In the Norwegian campaign, the Stuka proved its worth against naval vessels, sinking or damaging numerous Norwegian, French, and British ships and forcing the British Admiralty to withdraw the Royal Navy from Norwegian coastal waters. In France, Stuka crews maintained radio contact with German ground forces, which could order up dive bomber strikes against French formations blocking their advance, and in this role were instrumental in the success of the

German thrust through the Ardennes. At Dunkirk, Stukas sank and damaged French and British ships participating in the evacuation effort.

These victories gave the Stuka a fearsome reputation. It was instantly recognizable, with its distinctive bent wings and its non-retractable landing gear with aerodynamic covers. For a time, Stukas were fitted with a siren that made a sharp and eerie sound when the plane went into its dive, which I played for you in episode 324.

It was intended to strike fear into the hearts of the enemy on the ground and it succeeded, although the siren also created drag and the Luftwaffe eventually ordered it removed. Still, the sound would live on in Hollywood war pictures and cartoons.

As for the other two categories of planes, a light and a heavy fighter, the same company won the contracts for both: BFW, the Bayerische Flugzeugwerke, or in English, the Bavarian Aircraft Works. You know, like BMW, the Bayerische Motorwerke. The winning designs were officially designated Bf 109 and Bf 110. They were designed by Willy Messerschmitt. In 1938, the company was reorganized. Messerschmitt, who was chummy with prominent Nazis, took over the firm and it was renamed Messerschmitt. As a result, these two planes are unofficially though perhaps more commonly known as the Messerschmitt or Me-109 and 110.

The Me-110 was a large two-engine fighter that could also serve as a light bomber, with a crew of two or three and forward and rear machine guns. It wasn't as maneuverable as a smaller fighter but it was sturdier and packed a wallop.

But the real workhorse of the Luftwaffe was the Me-109 single-seat, single-engine fighter, capable of reaching speeds in excess of 600 km/h at altitude. The plane was nicknamed the Messer, short for Messerschmitt and also the German word for knife.

The 109 was first introduced into combat in Spain, where it quickly dominated the skies. It was responsible for the Luftwaffe winning air superiority over both Poland and Western Europe, making it instrumental in German victories there.

The Me-109 would be continually improved and would serve in the Luftwaffe through the end of the war. More than 34,000 of them were built, the largest number for a fighter aircraft in aviation history.

These were the main aircraft operated by the Luftwaffe in 1940. They had won victory after victory for Germany, but now they would face the biggest challenge in the short history of aerial warfare: the Battle of Britain.

But that is a story for a future episode. We'll have to stop there for today. I thank you for listening, and I'd especially like to thank Todd and Richard for their kind donations, and thank you to James for becoming a patron of the podcast. Donors and patrons like Todd and Richard and James help cover the costs of making this show, which in turn keeps the podcast available

free for everyone, so my thanks to them and to all of you who have pitched in and helped out. You know, there once was a time when I would have accepted advertising in this podcast, but my donors and patrons have convinced me it's not necessary. Nowadays I do receive the occasional sponsorship offer, but I always turn them down.

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If the idea of a *History of the Twentieth Century* tour interests you, please take a few minutes to fill out the survey form and let us know. I suggested Belgium as a possibility. Does that sound like a good idea to you? Or do you have a different suggestion? There's a part of the survey where you can express your opinion on that. The survey is only to gauge interest; it does not obligate you to anything. The link to the survey is on the podcast website, historyofthetwentiethcentury.com. The survey ends tomorrow, so this is your last chance to chime in and let us know what you think.

And I hope you'll join me next week, here on *The History of the Twentieth Century*. I'm still in background mode for the Battle of Britain. We've talked some about airplanes, now we'll talk strategy. We'll also take a look at an unexpected new technology that will become crucial in aerial warfare. Radio Detection and Ranging, next week, here, on *The History of the Twentieth Century*.

Oh, and one more thing. The mysterious disappearance of Amelia Earhart and Fred Noonan has led to a host of wild theories about their fate, which are still debated even today, 85 years later.

The simplest and most obvious explanation is that they ran out of fuel and their plane crashed into the ocean. No wreck has ever been found, but the oceans around Howland Island run as deep at 17,000 feet, so it is quite possible the wreck lies deep in Pacific waters, as yet undiscovered.

But there are some who won't settle for that explanation. A popular alternative possibility is that after being unable to find Howland Island, Earhart and Noonan turned south and crash landed on Gardner Island, about 400 miles away. A number of attempts have been made to search Gardner Island for evidence to support this hypothesis. Searchers have come up with bits of evidence they claim proves Earhart was on the island, including a woman's shoe, a woman's skull, and an aluminum panel claimed to have come from their plane, but none of this evidence is persuasive.

More provocative suggestions include that Earhart and Noonan strayed into the territory of the Marshall Islands, then controlled by Japan, and were captured by the Japanese. But the Marshall Islands are 800 miles away, and it is difficult to explain how they could have wandered that far off course. Even harder to understand is why the Japanese would take them prisoner and keep their whereabouts a secret, when it would have earned the Japanese government and military nothing but good publicity and American goodwill if they had publicly announced the rescue of the famous American aviator and returned her to the United States.

An even wilder explanation posits that Earhart and Noonan were secretly spying on the Japanese on behalf of the American government, which would explain why the Japanese might capture them and keep it secret, but calling this explanation farfetched would be charitable. The US government had better means of spying on the Japanese, and in any case, after the war, US intelligence services had access to Japanese military records and found no reference to Amelia Earhart.

Another variant of the Japanese-capture explanation suggests that Earhart became one of the women forced to make English-language propaganda broadcasts for Japan during the war. These women were collectively known to Allied soldiers as Tokyo Rose. Earhart's husband, George Putnam, took this idea seriously enough to listen to some of these broadcasts to see if he recognized her voice. He did not.

And a wilder explanation still suggests that Earhart deliberately faked her own death and lived out the rest of her life under a new identity. In 1970, a book titled *Amelia Earhart Lives* was published, laying out this suggestion and identifying a woman then living in New Jersey as Amelia Earhart. The woman in question promptly sued the publisher and the book was withdrawn.

In 1995, an episode of the US television series *Star Trek: Voyager* explained Earhart and Noonan's disappearance as an alien abduction, which is actually more plausible than most of these other stories.

[music: Closing War Theme]