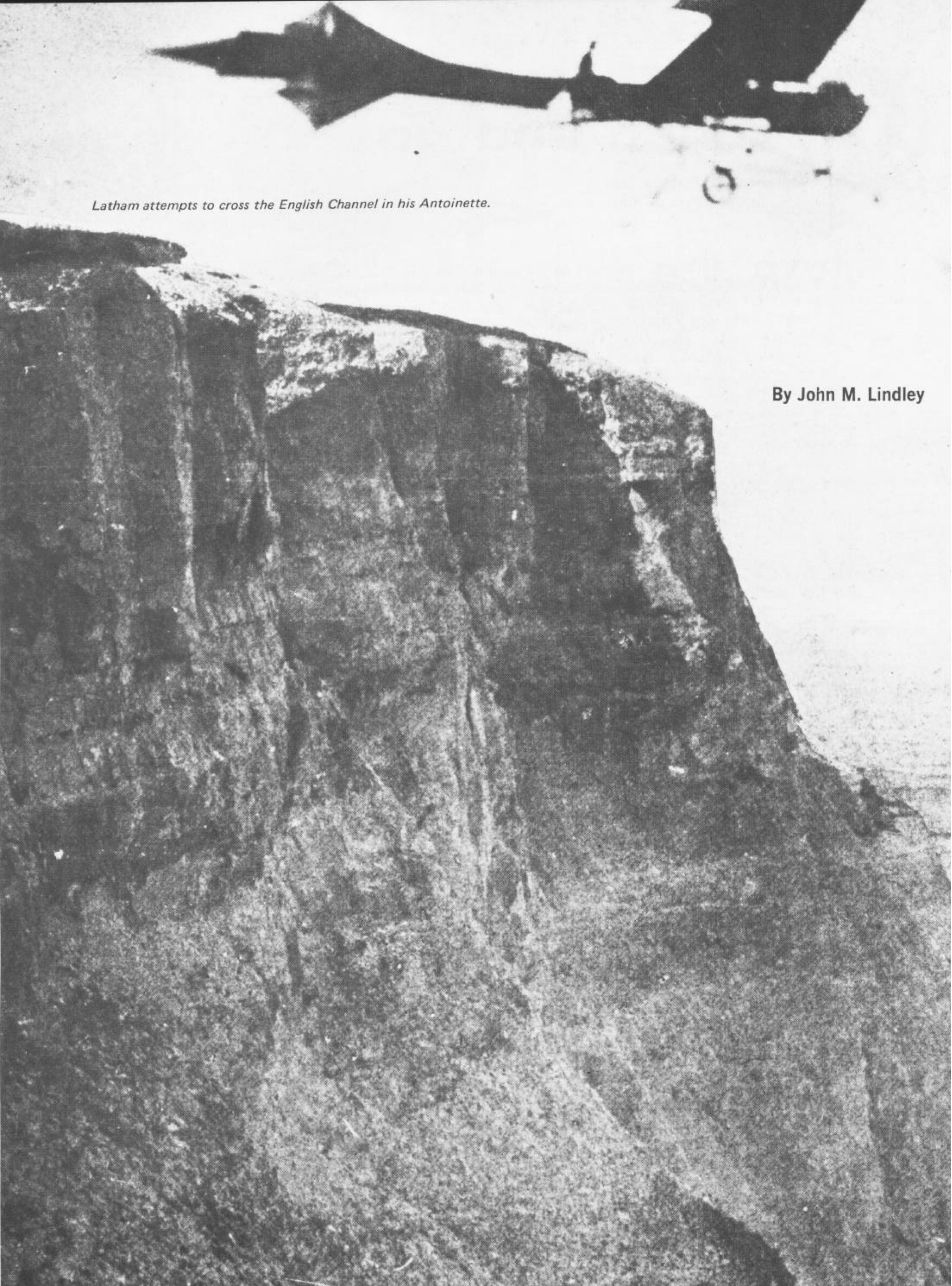
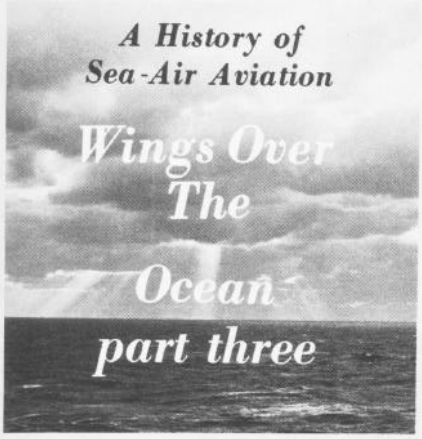


Latham attempts to cross the English Channel in his Antoinette.

By John M. Lindley



Both in the United States and Europe other aviation pioneers would extend and refine the Wrights' ideas about flying. One outgrowth of this work that is of particular importance for sea-air aviation was the development of the hydroplane, or seaplane, between 1910 and 1912. A Frenchman, Henri Fabre, made the first hydroplane flight in March 1910. Using a float-plane powered by a 50-hp Gnome engine, Fabre took off, flew about a third of a mile, and alighted on the water at Martigues near Marseilles. Later that year, Fabre made seaplane flights up to two miles in length.

The honor of having built a practical seaplane belongs, however, to Glenn Curtiss of the United States. Born in Hammondsport, a small village in central New York situated on Lake Keuka, Glenn Curtiss got his business start as the owner of a bicycle shop. From bicycles his interest turned to motorcycles and, in 1902, he formed the G. H. Curtiss Manufacturing Company to make and sell motors, motorcycles and accessories. The following year Curtiss won his first national motorcycle championship. In 1907 he set a record by riding a motorcycle of his own design and construction 136.3 miles per hour, a speed faster than any man had ever gone.

Glenn Curtiss became involved in aviation when Thomas Scott Baldwin, who was a dirigible balloonist, ordered an engine from the Curtiss firm. The Curtiss engine performed so well that other balloonists sought Curtiss power plants. In 1905 Baldwin and Curtiss collaborated in building the first Army dirigible. But two years later Curtiss turned his attention from dirigibles to airplanes, after meeting Dr. Alexander Graham Bell and learning of his ideas about aviation.

On September 30, 1907, Bell, Curtiss, Bell's wife and three other aviation enthusiasts (one of whom was Lt. Thomas E. Selfridge, USA) formed the Aerial Experiment Association (AEA). The sole purpose of the AEA was to build a man-carrying, powered aircraft designed by Bell. Curtiss served as director of experiments for AEA. In the 18 months during which AEA existed (it was dissolved by mutual agreement on March 31, 1909), Curtiss helped to build several aircraft. The third of these machines, *June Bug*, won the *Scientific American* Trophy at its first public flight in the United States.

This prize was the first of three *Scientific American* Trophies which Curtiss would win. He also won the first Gordon Bennett Trophy at Rheims, France (1909), in competition with Europe's finest pilots, and *The World* (New York) prize of $10,000 for a flight from Albany to New York City in 2 hours and 51 minutes.

While Curtiss was working with AEA and also becoming a famous aviator, he fitted the *June Bug*, in 1908, with twin floats which were little more than covered canoes. The result was a seaplane which he named the *Loon*. Despite having mounted a more powerful engine on the *Loon*, Curtiss was unable to get it airborne.

Undeterred, Curtiss kept experimenting. For example, when he made his prize-winning flight from Albany to New York City in May 1910, Curtiss attached an inflated tube of rubberized cloth in a fore and aft direction along the landing gear. He also fixed a small hydrofoil on the end of the tube to prevent the plane from capsizing. Flotation tanks mounted on the wing tips also helped to balance the plane if it had to land on water. Curtiss never tested this crude flotation apparatus because he planned to use it only if he had to make an emergency landing in the Hudson River.

When the U.S. Navy encouraged Curtiss to continue experimenting with hydro-aeroplanes, he subsequently hit upon an efficient flotation system more by trial-and-error methods than by scientific theory. He tested all sorts of floats, secured in various places on his aircraft. Eventually he found that a large float, six feet wide, seven feet long, and up to ten inches thick with a flat bottom positioned in a downward angle of about ten degrees, worked satisfactorily. Curtiss kept tinkering with this configuration until he had modified it to a single float 12 feet long, 2 feet wide, 1 foot thick and weighing about 50 pounds, which was mounted under the center section of the plane. For balance he mounted tubular floats and paddles on the wing tips.

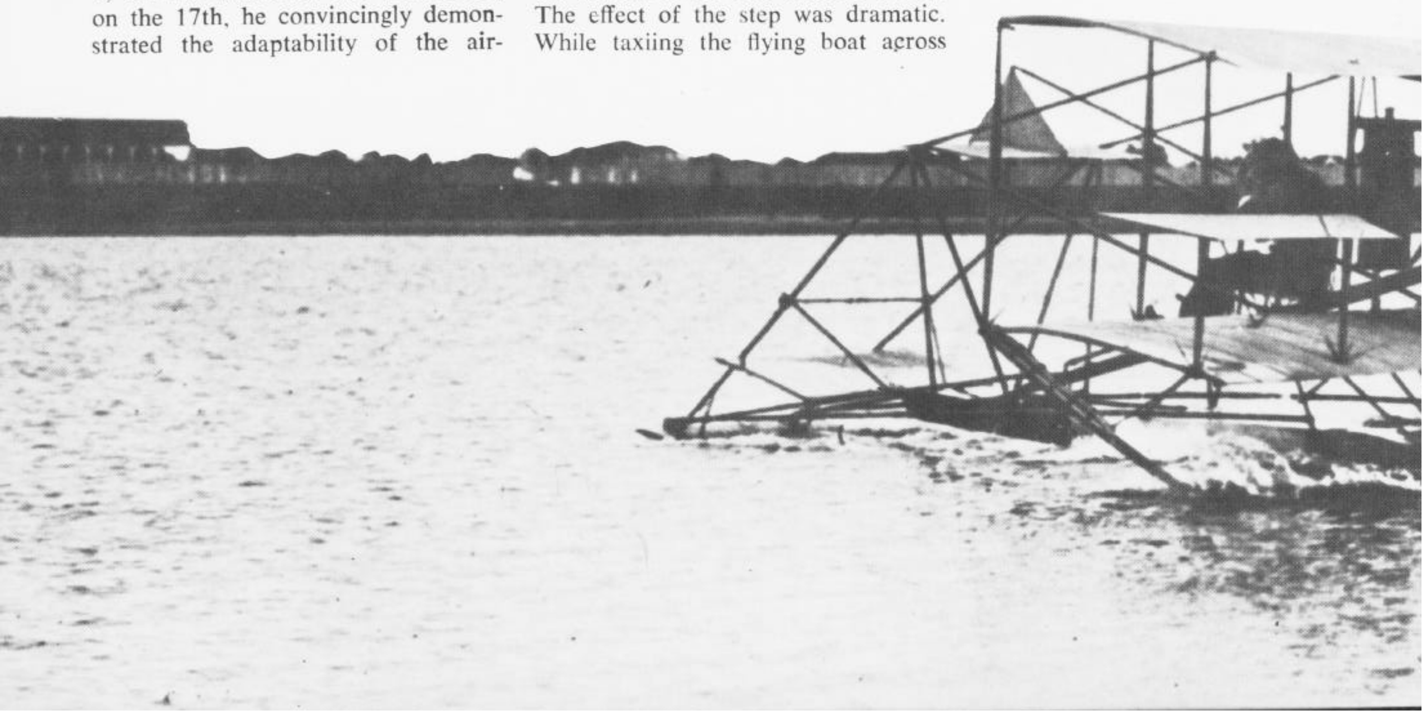
Glenn Curtiss first tested this single main (or sled profile) float successfully on San Diego Bay on February 1, 1911. A little over two weeks later, on the 17th, he convincingly demonstrated the adaptability of the airplane to naval uses when he taxied his tractor hydro-aeroplane across the bay to USS *Pennsylvania*. Using a boat crane, the ship's deck force hoisted Curtiss' plane aboard and then lowered it back into the water. Whereupon Curtiss returned to his base at North Island. A few days later the inventive Curtiss added a tricycle landing gear which could be raised or lowered with a lever by the pilot. The result was the first amphibian which Curtiss called the *Triad* because it could operate from land, from water and in the air.

In recognition of his pioneering development of the seaplane, Curtiss received the Robert J. Collier Trophy and the Aero Club of America Gold Medal in 1911. Sale of a hydro-aeroplane and a land-plane trainer to the U.S. Navy, along with a few other sales to aviation enthusiasts, soon enabled Curtiss to expand his enterprise. Within a few years he had sold similar machines to England, France, Italy, Germany, Russia and Japan.

Curtiss was not satisfied, however, with just having converted a landplane for use on the ocean. Using his trial-and-error technique once more, he began work on producing an airplane with wings, engine and propeller on a true boat hull. Together with Naval Constructor Holden C. Richardson, a naval officer and engineer, Curtiss found that he could improve the performance of a flat-bottomed boat hull by mounting blocks athwartships on the bottom of the hull to make a step. The effect of the step was dramatic. While taxiing the flying boat across the water, these blocks broke up the suction effect of the water on the after portion of the hull, thereby providing a much quicker getaway. This first Curtiss flying boat had a 26-foot hull that was three feet wide and three feet deep. A single hydroplane step ran the width of the flat bottom. The flying boat also had biplane wings and an 80-hp Curtiss Model O, V-8 water-cooled engine. Cylindrical floats on the wing tips gave additional balance to the aircraft.

Two years after he had developed the flying boat, Curtiss built the *America,* another flying boat, for wealthy aviation patron Lewis Rodman Wanamaker. When it was finished in 1914, the *America* was the first heavier-than-air craft designed for transAtlantic flight. While Curtiss had been busy with these projects, the Smithsonian Institution had awarded him the coveted Langley Medal for his development of the hydro-aeroplane.

Thus in a period of less than 10 years from the first powered flight at Kitty Hawk, Glenn Curtiss had initially adapted the landplane for practical use on the water and then had built the amphibian and the flying boat. Aviators now had practical aircraft for use on the land or on the sea. The next logical step in the development of sea-air aviation was the conquest of distance, particularly the Atlantic and Pacific Oceans. In the attempts to conquer over-ocean dis-



tance, modern descendants of Daedalus would try to shrink the globe by reducing the time necessary to travel between any two major cities, say New York and Paris. Some of these brave pilots would give up within hours after they had started because of some unexpected problem or unforeseen danger. Others would fall from the sky like Icarus, doomed by a failure in the oil line, or a faulty compass, or bad weather conditions — instead of the heat of the sun. Nevertheless, there were others who were careful, as well as brave, who would succeed, and although their destinations differed from that of Daedalus, their goals were very similar.

The Development of Transoceanic Flight

Once mankind had taken to the highways of the air, flying only over the land would not suffice as a means for conquering distance and for providing freedom of geographical mobility. Mankind would also have to learn to fly over the oceans. The development of sea-air aviation would not, however, come easily. The oceans of the world cover nearly three-quarters of the earth's surface. There are few landmarks by which aviators can navigate once they have left friendly shores behind. The weather over the seas is often stormy and uncertain. The surface of the oceans, even near land, provides few safe havens for an aircraft in trouble. Yet these obstacles had to be confronted and overcome if man was going to fulfill the ancient promise of flight.

The gradual development of transoceanic flight came through a series of historic flights over the Atlantic, Pacific and Polar Oceans. Yet an account of the important firsts in sea-air aviation is an inadequate chronicle if it fails to illuminate the process by which aviators learned to fly the oceans as easily and as safely as they learned to fly over land. Today the air traveler thinks no more about the problems of flying from New York to Paris than he thinks about the difficulties involved in jetting from New York to Los Angeles. Within a few hundred miles, the distances are nearly the same; however, one flight is over the Atlantic, the other is over the continental United States. Yet any reader of Lindbergh's account of his flight from San Diego to New York via St. Louis, prior to his nonstop solo flight from New York to Paris, is aware that he and the public weighed the difficulties involved in the two flights quite differently. In 1927, Lindbergh's San Diego to New York air time of 21 hours, 45 minutes set a record; yet his 33½-hour flight from New York to Paris rightly received public acclaim as the more difficult achievement.

Before beginning an account of the various historic flights over the oceans of the world, one additional point needs to be made about them. In 1919, C. G. Grey, the editor of the British aviation weekly *The Aeroplane*, assessed the impact of the dramatic first flight across the Atlantic by LCdr. Albert C. Read and his crew in the U.S. Navy flying boat NC-4. In his analysis, Mr. Grey remarked: "After the first non-stop journey we shall begin to introduce an illimitable series of minor classes in the competition. We shall have the 'first one-man flight,' then we shall have the 'first flight with one engine,' 'the first flight with two engines,' . . . 'the first flight with one passenger,' 'the first flight with ten passengers,' 'the first flight with a woman passenger,' and so forth and so on *ad infinitum.*"

Editor Grey's point was very simple. What really counted was that the NC-4 had been the first aircraft to cross the Atlantic and that it deserved full credit and honor for having been first. In making this point, Grey showed great prescience. An "illimitable series" of competitions did spring up after the flight of the NC-4 in a manner very similar to what he had predicted. Within the limits of space in this history it is neither possible nor productive to recount all the firsts in sea-air aviation. Nevertheless, Mr. Grey's warning is, in one sense, misleading. If aviators around the world had been content to let the achievement of an aviation first stand unchallenged in other classes of competition, then there would have been a much slower and more hesitant development of transoceanic flying. The very competition among the illimitable classes which Grey frowned upon was, in part, directly responsible for fostering the development of over-ocean flying. When sea-air aviation

Curtiss hydro-aeroplane

firsts became commonplace, the general public no longer had grounds for looking upon transoceanic flying as a dangerous sport fit only for a few gallant souls. Instead commercial aviation began to gain broad acceptance as a means of safe transportation for the great mass of persons who wanted to get quickly from one place to another, even when that meant flying over the ocean.

Sea-air aviation began with balloons. Two years after the Montgolfiers had invented the balloon, Jean Pierre Blanchard and a rich American physician, Dr. John Jeffries, crossed the English Channel from Dover to a forest near Calais on January 7, 1785. When Blanchard and Jeffries reached France, they had trouble with a too-rapid descent. These pioneer aeronauts had to throw out all their ballast and even part of their clothing to slow the descent of the balloon and to avoid crashing. Two Frenchmen, Pilâtre de Rozier and P. A. Romain, tried to duplicate the feat of Blanchard and Jeffries in the reverse direction on June 15, 1785. They used a hydrogen-filled gas bag fitted with a hot-air cylinder heated by a large burner beneath it, which they expected would help in controlling the altitude of their craft. Unfortunately the device worked for only a short time before it ignited the hydrogen, causing both men to fall to their deaths. They were the first aeronautical deaths.

Aeronauts were not deterred by the disaster which killed de Rozier and Romain. Jean Pierre Blanchard came to the United States in 1792 and made what is believed to have been the first air voyage in America using a hydrogen-filled balloon. Blanchard ascended, on January 9, 1793, from the yard of the old Walnut Street Prison in Philadelphia leaving behind a throng of people, including President George Washington, who had given Blanchard a letter of introduction. The flight lasted 46 minutes and Blanchard descended some 15 miles to the southeast, across the Delaware River near Woodbury, N.J.

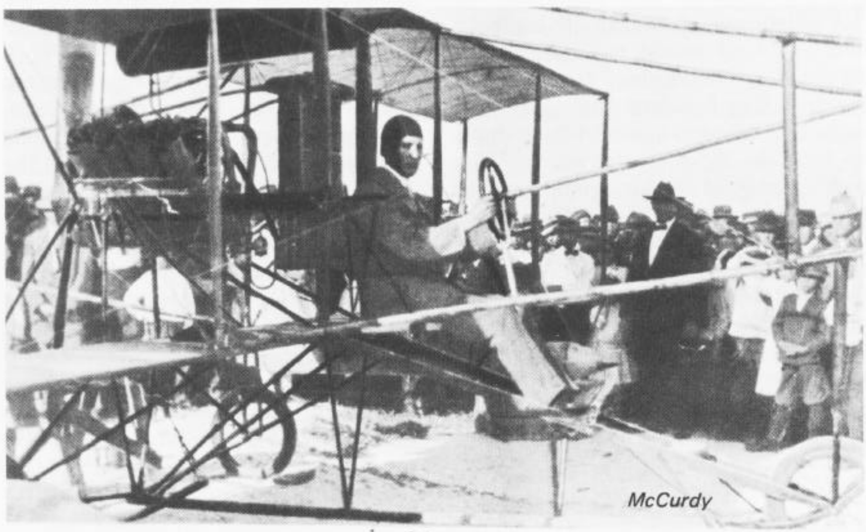
Balloonists soon began to make greater demands on their craft than crossing the English Channel or the Delaware River. By 1836 an English aeronaut named Charles Green predicted that crossing the Atlantic Ocean by balloon would be possible. Four years later, Green built a small model balloon which was powered by spring-driven propellers. This forerunner of the dirigible was further developed by a fellow aeronaut, Monck Mason, who in 1843 built a model balloon with a clockwork motor that propelled it at about five miles per hour. At the same time an American balloonist, John Wise, petitioned Congress for a grant of money to construct a balloon capable of making the crossing from the United States to Europe. Congress refused, however, to support Wise's scheme.

With the public growing more conscious of ballooning, the *New York Sun* published, on April 13, 1844, an account of what it thought was the first crossing of the Atlantic by air. The English aeronaut Monck Mason and seven others had made the trip in 75 hours in the "steering balloon" *Victoria* from Great Britain to Sullivan's Island, S.C. The *Sun* account waxed grandiloquent. "The great problem is at length solved. The air, as well as the earth and ocean, has been subdued by science and will become a common and convenient highway for mankind. The Atlantic has been crossed in a balloon and this, too, without difficulty, without any apparent danger, and with thorough control of the machine, and in the inconceivably short period of seventy-five hours from shore to shore."

Alas, the *New York Sun* was a victim of Edgar Allan Poe's "Balloon Hoax." There had been no crossing by Mason and companions. Poe had merely written an account of what a transoceanic flight might have been like.

Although John Wise made a second request to Congress in 1851 (which was again rejected) and actually attempted a crossing in 1873, which ended in a crash in Connecticut, the Atlantic has never been crossed by free balloon. The first air crossings would not come until the twentieth century and they would be made by heavier-than-air craft rather than balloons. But before the U.S. Navy's NC-4 and the British aviators Alcock and Brown made those historic flights of 1919, early aviators, like early balloonists, first had to conquer the English Channel.

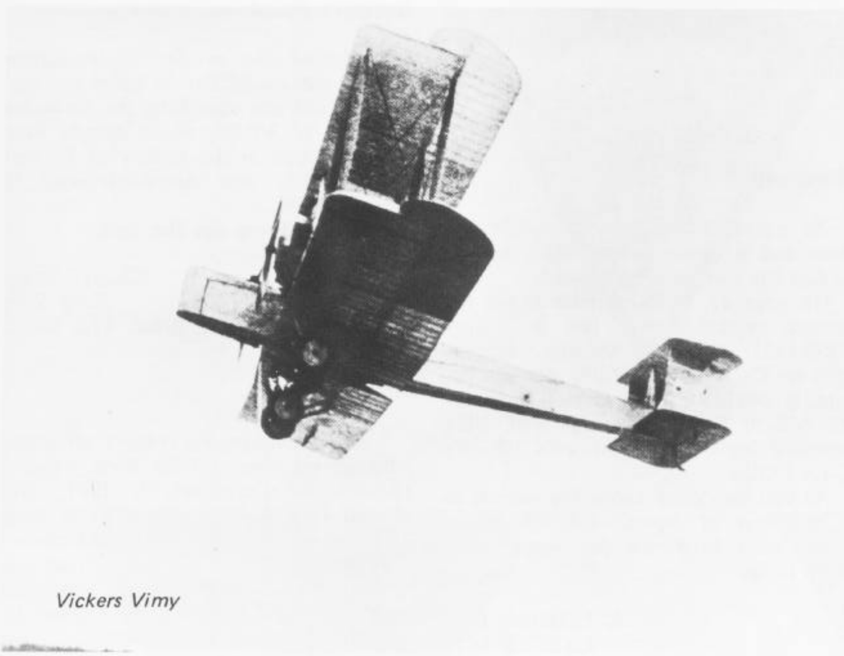
In 1909 the London *Daily Mail* offered a prize of £1,000 (about $5,000) for the first airplane flight



McCurdy

across the Channel. Twice in 1909 Hubert Latham tried to make the crossing in an Antoinette monoplane. On July 19th he left France for England, but engine trouble forced him down into the sea seven miles short of his goal. A French torpedo boat rescued him. Undaunted, Latham tried again on July 27th. This time he got within a mile of the English coast before engine trouble again forced him into the water. Again he was rescued.

Even if Latham had succeeded in this second try, he would not have been first because another Frenchman, Louis Blériot, had already flown across the Channel on July 25th. Blé-



Vickers Vimy

riot had been building and flying aircraft for several years before he took off from Sangatte on the coast of France at 4 a.m. At the time, Blériot was suffering from a leg injury received in an earlier aircraft accident. Shortly after 5 a.m. the French pilot arrived over the English coast having made the crossing in an official time of 37 minutes. Blériot's plane was his #11 monoplane which had a 25½-foot wingspan and a 25-hp engine.

As if as a forecast of future difficulties in sea-air aviation, Blériot reported to his English hosts that within 10 minutes after having left France, he had lost sight of land and become uncertain as to where Dover was. Lacking a compass, Blériot let the plane take its own heading, which took him to Deal, a town far to the north of where he expected to land. One British authority, Sir Alan Cobham, commented that Blériot's flight "marked the end of our insular safety, and the beginning of the time when Britain must seek another form of defense besides its ships." Although he may have been aware of the consequences of his flight on England's insular safety, Blériot was probably more immediately gratified by the celebrity and wealth which he gained as a designer and builder of aircraft following the flight.

Bleriot

The next significant step in the development of over-ocean flying occurred in 1911 when John A. D. McCurdy, a former member of the Aeriel Experiment Association of Alexander Graham Bell and Glenn Curtiss, tried to fly from Key West, Fla., to Havana, Cuba, a distance of about 106 statute miles. McCurdy took off from Key West early on the morning of January 30 in a Curtiss biplane and headed for Cuba using a magnetic compass and visual checks on a series of four U.S. Navy destroyers which were stationed along the route of the proposed flight to guide him toward Havana. Flying at an altitude of from 700 to 1,500 feet and at speeds between 40 and 50 miles per hour, McCurdy had covered about 90 miles when the oil lubricating system in his engine malfunctioned forcing him to alight on the sea. The destroyer *Terry*, which was following McCurdy, immediately rescued the aviator and his plane.

Although he did not reach Havana, McCurdy did stay aloft for 2 hours and 11 minutes before he had to ditch his plane. Besides making the longest over-ocean flight to date and the first sea flight out of sight of land, McCurdy's effort also had its financial rewards — a $5,000 prize from a Havana newspaper and a $3,000 prize from the Havana city fathers. Prior to the flight, the *New York Times* had editorialized that McCurdy's proposed flight would "in no degree advance the art of aviation" and would "prove nothing except the aviator's willingness to risk his life unnecessarily," but the brave Canadian pilot proved the *Times* to be wrong. His flight not only showed the effectiveness of having naval vessels stationed along the aviator's proposed route to minimize the risks involved and to aid in navigation, but also demonstrated that airplanes could safely fly long distances out of sight of land. Thus McCurdy set the aerial stage for others who would come later to attempt a crossing of the Atlantic, and he showed the U.S. Navy how that crossing might possibly be done.

To be continued