

Flight Training and American Aviation Pioneers

by James K. Libbey



Lt. Thomas Selfridge with Orville Wright at Fort Meyer.

The pioneering spirit in aviation is fundamentally different from the one found in most other forms of endeavor. There is something about the very term “aviation” that adds dash and danger and romance to the pioneering concept. We do not confuse, for example, the aviation with the software pioneer. When computer whiz Bill Gates crashed at Harvard University in 1974, he went for a brew; when aviatrix Harriet Quimby crashed at Boston in 1912, she went to the morgue.¹

Indeed, the dangers inherent in early flight produce a key ingredient in how we define aviation pioneers, at least those we identify before 1912: they generally taught themselves how to fly. From this fact emerges the obvious. Many pioneers endured accidents and experienced bodily harm.²

Amply recorded by contemporaries and later historians was the prize-winning, fame-producing, pioneering flight by French aviator Louis Bleriot. He flew across the English Channel in July 1909. Fewer remember that just five months later he suffered his thirty-second airplane crash, this one near Constantinople (now, Istanbul). The accident was so serious and injured Bleriot so severely that it all but ended his flying career.³

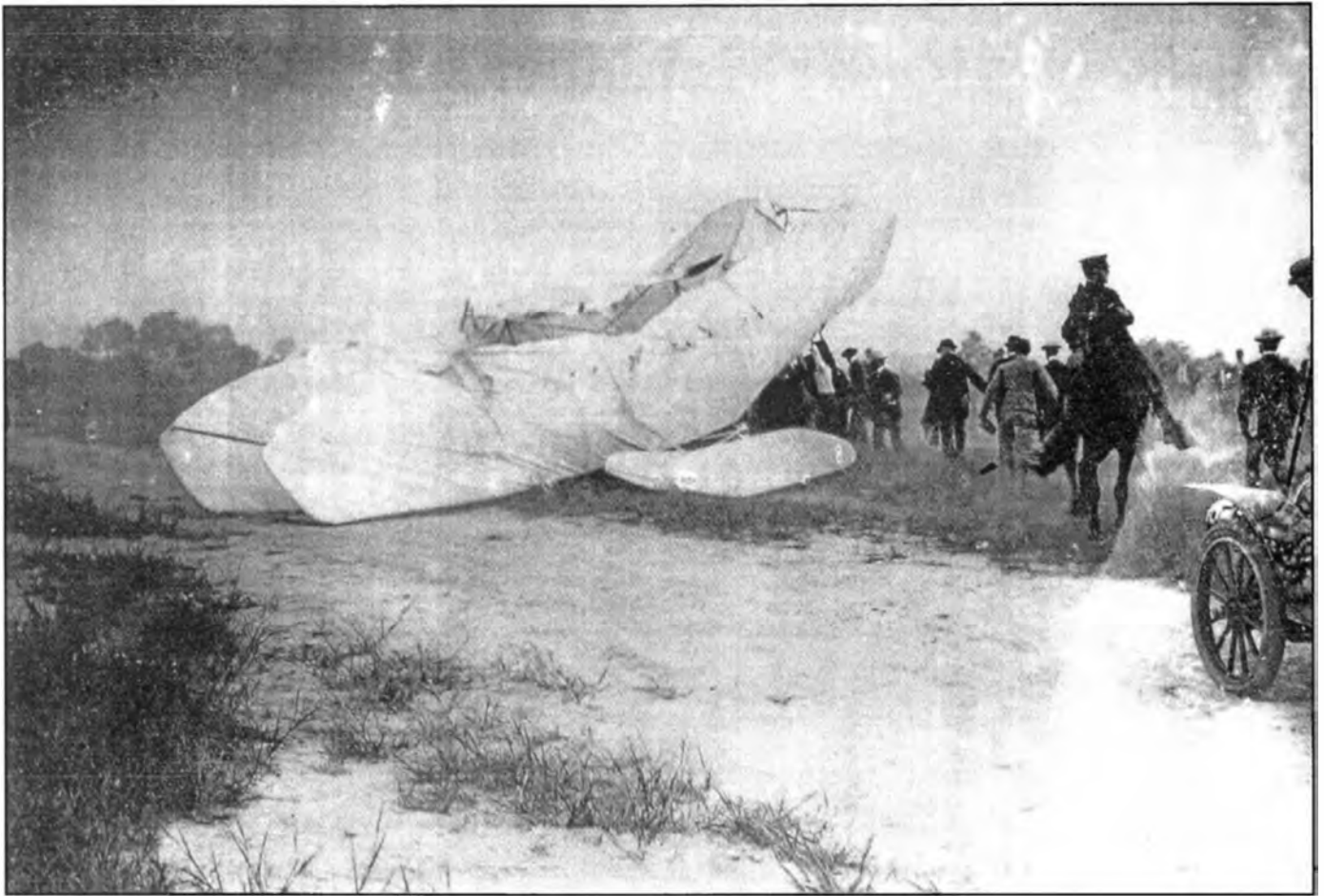
Russian pioneer Igor Sikorsky also experienced numerous accidents when he taught himself how to fly. Maddeningly, from Sikorsky’s perspective, most of his “unexpected” landings were due to engine failure. After he enjoyed public and

governmental acclaim for his *Model 6* and acquired the financial backing of a large company, Sikorsky built *The Grand* in 1913. He designed the four-engined behemoth so its pesky powerplants could be serviced in flight.⁴

The prize for dogged determination in learning flight must go to the American, Clyde Cessna. After he purchased a U.S. copy of Bleriot’s *Model XI* early in 1911, he packed his family and moved to Oklahoma’s Great Salt Plains where he taught himself how to fly. Cessna succeeded, but only after six months of innumerable teeth-rattling crashes that made him a world class expert on repairing airplanes.⁵

Like many pioneers, Cessna, Sikorsky, and Bleriot initially attracted attention precisely because they had taught themselves how to fly and had become expert pilots. Indeed, all three gained publicity by their exhibition or distance flights. Their fame, however, was sustained and broadened by the fact that they also designed, built, and sold airplanes to the public and/or military.⁶

As entrepreneurs and salesmen, they had every reason to convert the act of flying from a death-defying stunt to a reasonably safe activity that would appeal to their future customers. Thus many pioneers, especially those who built and sold aircraft, involved themselves in flight training. And this characteristic was equally true of America’s first aviators: Orville and Wilbur Wright and Glenn Hammond Curtiss.⁷



Crash of the Wright Flyer that killed Lt. Selfridge, September 1908. U.S. Air Force Museum

The Wright brothers fully appreciated the dangers of their invention. For example, on September 17, 1908, Orville suffered a terrible accident during a demonstration flight for the United States Army at Fort Myer, Virginia. Some of his injuries painfully reminded him of the accident for the next forty years of his life. Worse, his passenger, Lieutenant Thomas E. Selfridge, holds the macabre record as the first fatality in the history of heavier-than-air, powered flight.⁸

Since the Wrights developed into superb aviators, it should come as no surprise that those who followed literally in their footsteps and piloted successors to the Wright *Flyer* might also have mishaps from time to time. The dangers of flight were exacerbated in Wright machines by the conscious decisions of Orville and Wilbur to design an aircraft that afforded maximum control to the pilot. In short, the brothers produced an airplane that was not inherently stable.⁹

Unlike their European counterparts, the Wrights abandoned the steadying influence of dihedral wings in favor of the more exciting opposite, anhedral, in which the wing root is higher than the tip. Then in front of the *Flyer*, the brothers placed an elevator minus a horizontal stabilizer. The result was "positive" pitch (up or down) control, a term that could be translated as "frighteningly quick" by novice pilots who sometimes experienced a flight that bore a close resemblance to a ride on a bucking bronco.¹⁰

Regardless, the Wrights understood the need to train those who would fly their machines. Shortly after Orville and Wilbur incorporated the Wright Company on November 22, 1909, they established a flight training center at Simms Station (Huffman Prairie) near their home in Dayton, Ohio, as well as a winter facility in Montgomery, Alabama.¹¹

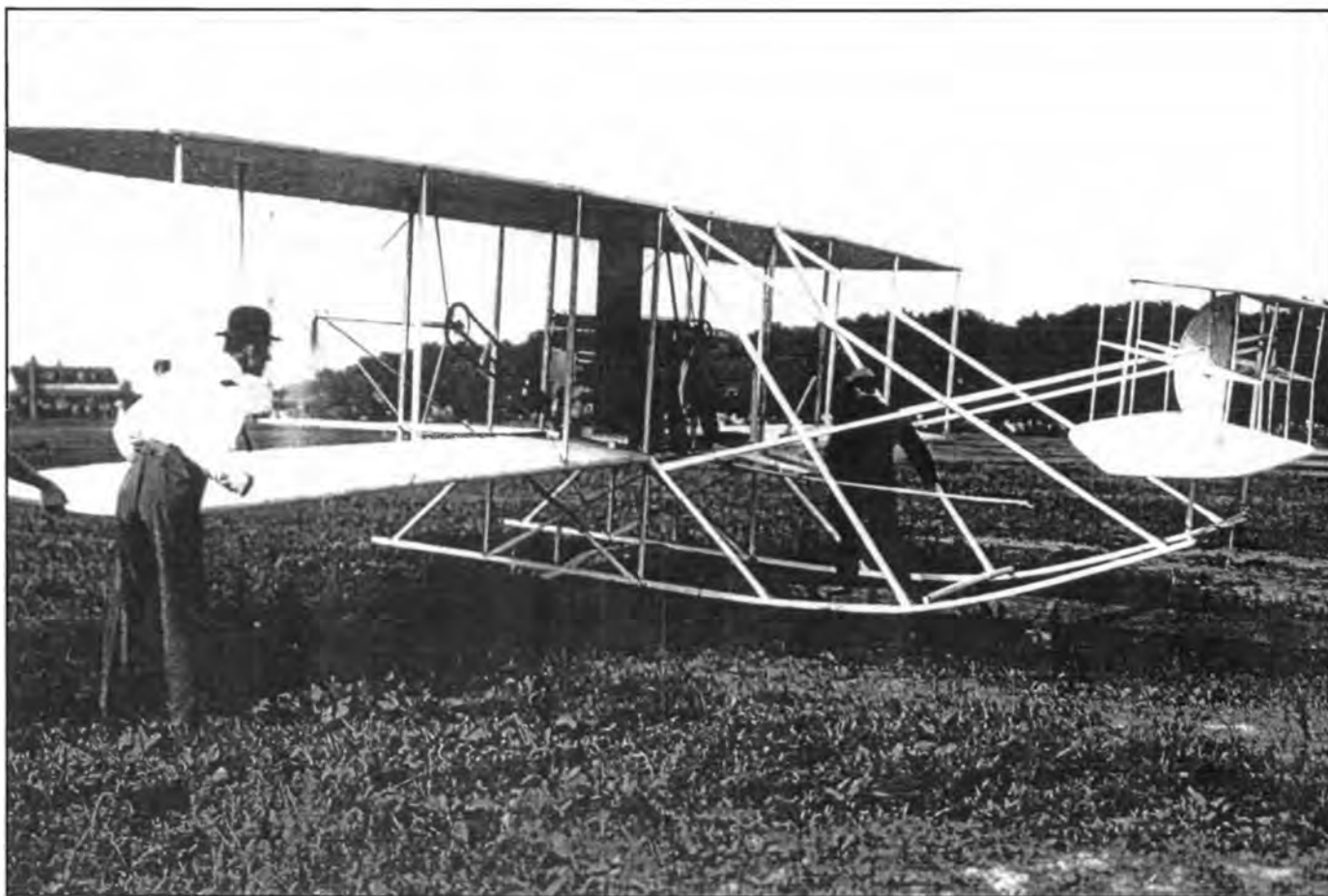
No secret that their compelling interest in flight training focused initially on creating a group of company pilots. The Wright exhibition team garnered cash and publicity for the firm by performing public demonstrations. Because air show impresarios were charged \$1,000 (adjust now to \$20,000) per day per pilot, one can literally measure the importance of training good exhibition pilots.¹²

An even better documented flight training program was established by the Wrights for one of their first customers, the U.S. Army. The successful conclusion of acceptance trials at Fort Myer on July 30, 1909, produced a \$30,000 purchase contract on August 2. Besides acquiring an airplane for the army, the document stipulated (by referring to Signal Corps Specification No. 486) that the Wrights train two officers in the operation of the *Flyer*.¹³

This part of the contract would be fulfilled by Wilbur in October-November 1909. He returned to the Washington, D.C., area to train Lieutenants Frank P. Lahm and Frederick E. Humphreys in the art and science of flight. Lt. Benjamin D. Foulois, who was originally designated for training but was then assigned to attend an aviation congress in France, returned in time to profit from a portion of Wilbur's instructions.¹⁴

Flight training did not take place on the same parade grounds at Fort Myer where the Wrights originally demonstrated their airplane. The post commandant refused to relinquish the area because he did not want the newfangled device to further disrupt his schedule of drills and maneuvers for the cavalry unit stationed at the fort.¹⁵

Using a balloon and aeronaut, the military scouted the countryside and located and subsequently leased a 160 acre



Wilbur and Orville Wright setting up the Model A on the launching track before a flight at Fort Meyer, summer 1909. U.S. Air Force Museum

pasture near an agricultural school in College Park, Maryland. Improvements were made to the tract of land and a hangar was built to store the Signal Corps Airplane Number 1, later named *Miss Columbia*. It was the same *Flyer* the Wrights used for their acceptance trials.¹⁶

The army had cut down shrubs and trees and had prepared a flat course two-thirds of a mile long. Like the original *Flyer*, *Miss Columbia* used skids for landing gear rather than wheels. Thus a monorail starting track was layed down on the field along with a trolley and catapult system employing weights and pulleys to help launch the aircraft. Naturally, the temporary airfield lacked living quarters and so Wilbur and the students commuted in the evenings to an apartment in College Park.¹⁷

Training began on the morning of October 8 and continued daily except Sundays until November 2, involving a total of fifty-five flights. The latter generally occurred early mornings and late afternoons when winds were lighter and hence more favorable for operating the fragile machine.¹⁸

Wilbur's instruction started with a flourish and employed a total of five flights during the first session. He flew three short flights partly to demonstrate *Miss Columbia*'s capabilities to his students, but also to test the trolley, track, and catapult system and measure field conditions for landing the skid-equipped aircraft.¹⁹

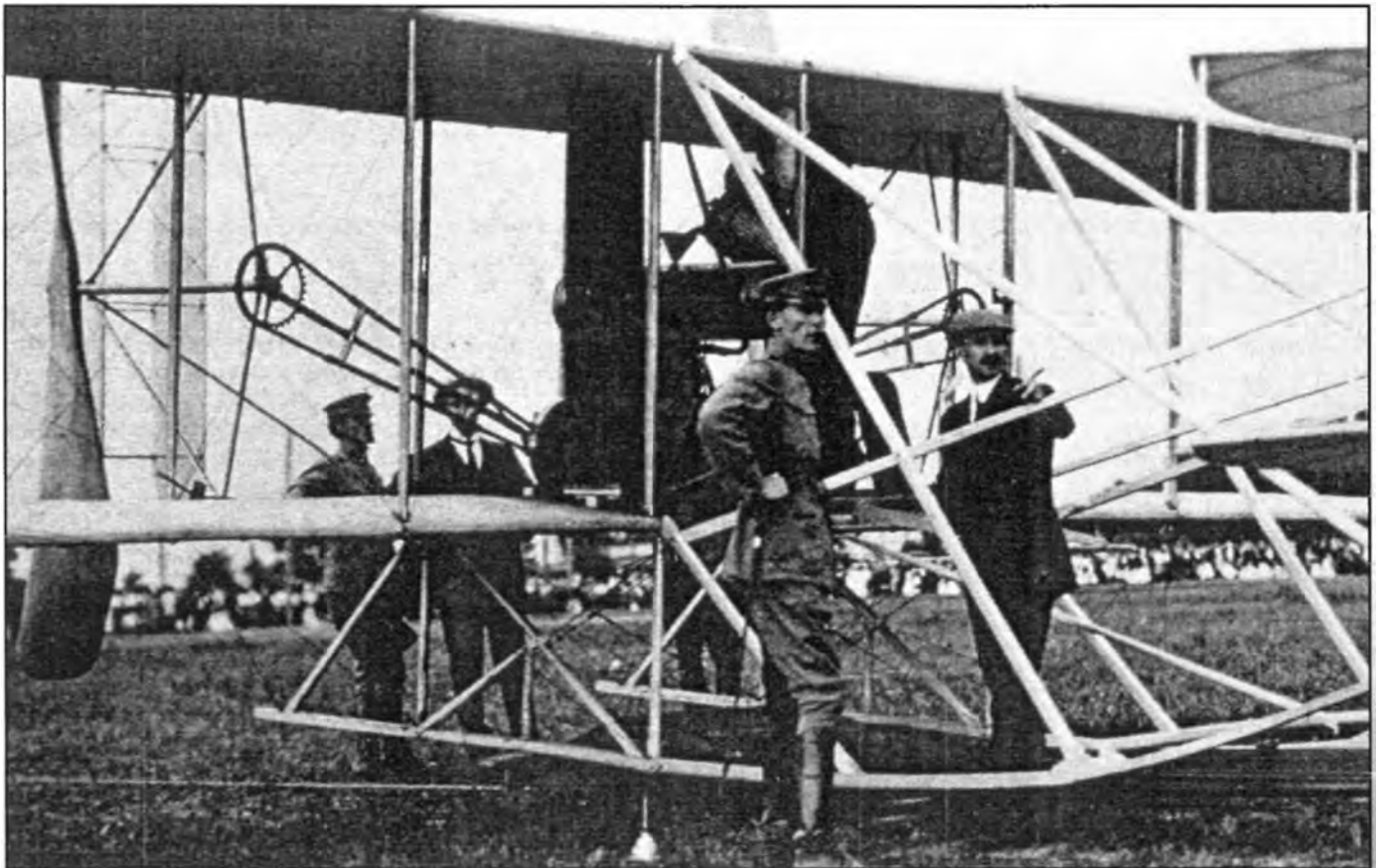
Next, Wilbur took separately Lahm and Humphreys on short orientation flights lasting approximately five minutes each. Hence the elder Wright brother initiated the military to the now time-honored tradition in flight training of the dual method in which the instructor conducts training by flying with the student.²⁰

This was made possible by more robust engines in succeeding versions of the *Flyer*. Originally, one person lay prone next to the motor on the lower wing of the biplane. Together, the powerplant and pilot marked the center of gravity and balanced the craft. *Miss Columbia*, which some commentators also label the Wright Model A, carried two people sitting upright, equalizing a heavier and more powerful engine.²¹

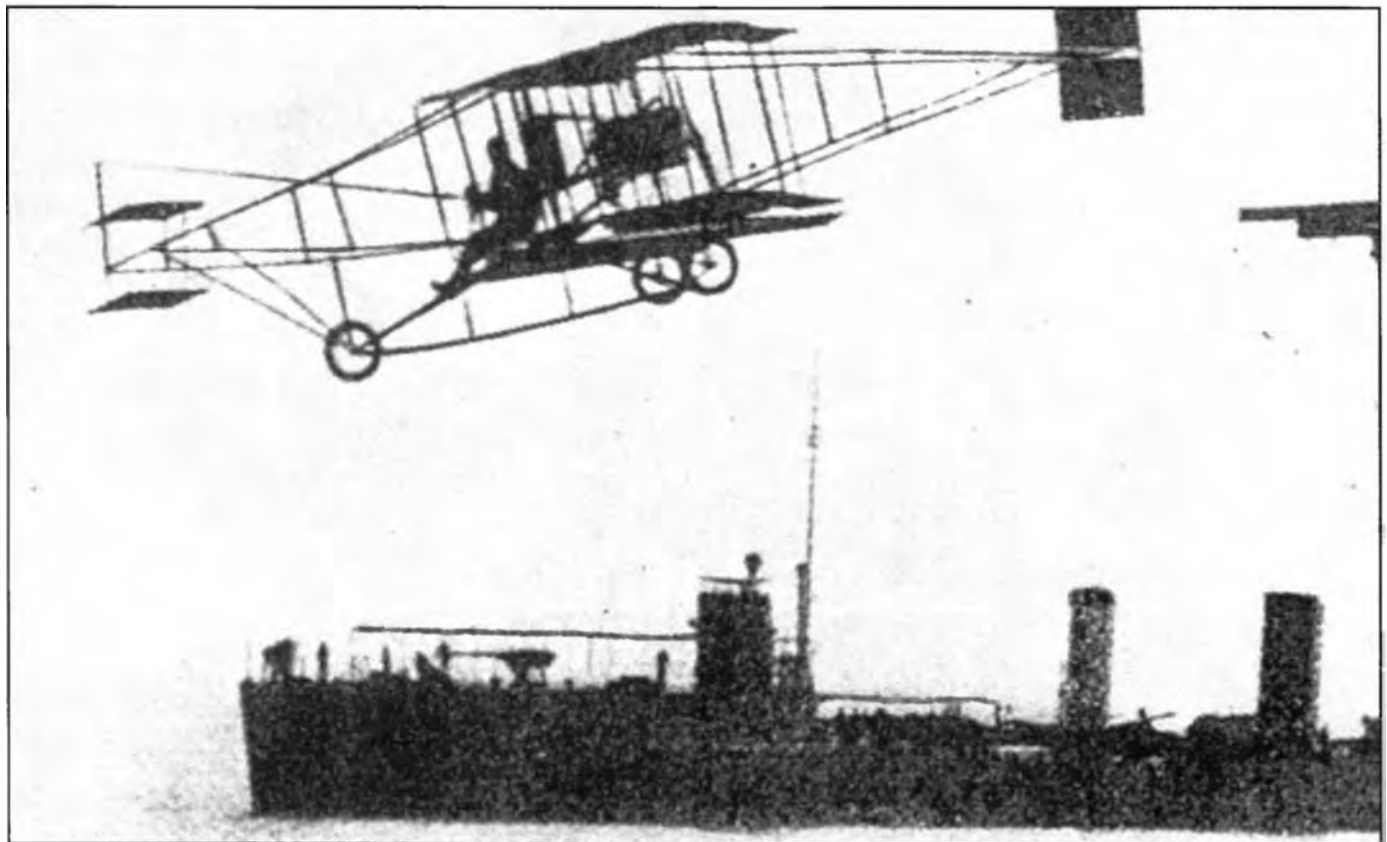
As a result, student and instructor sat side-by-side. Each possessed an outside stick to adjust the elevator and shared between them a third stick regulating a coordinated rudder and wing-warping mechanism to rotate the aircraft. Wilbur advanced the knowledge and skill of his charges through incremental steps. The lieutenants began with short hops at low altitudes to gain a feel for flight and the controls and then progressed to longer trips and higher altitudes where they could safely learn and perform such basic maneuvers as the turn.²²

As most individuals who have taken flight lessons can appreciate, landing turned out to be the hardest part of the training program. The neophyte pilots discovered that even when their approach to the field seemed perfect and they cut-off the engine at the right moment before touchdown, they often faced a bumpy and an abrupt end to their flight because of the skids. Since early aero engines proved unreliable, Wilbur also taught the officers powerless (deadstick) landings from higher altitudes.²³

The elder Wright made no effort to create a ground school and text to tutor Lahm and Humphreys on the principles of flight and the construction of *Miss Columbia*. On the other hand, both men subsequently published commentaries on their experiences. These memoirs clearly reveal that Wilbur thoughtfully and thoroughly answered their questions on every



Left to right: Lt. Benjamin Foulois, Wilbur Wright, Lt. Frank Lahm, and Orville Wright during the trials of Model A. summer 1909, Fort Meyer. U.S. Air Force Museum



Eugene Ely flying in a Curtiss Model D off the wooden platform of the USS Birmingham, November 1910. U.S. Naval Aviation Museum

imaginable subject related to the mechanics of both flight and the airplane.²⁴

The officers soloed successfully on October 26 and thereafter flew singly or together but generally without their instructor. Meanwhile, Benjamin Foulois returned from the aviation congress in France. Even though Wilbur Wright had no contractual obligation to do so, he provided several lessons to Foulois who supplemented his flight experience by instruction from his colleague Humphreys.²⁵

Regardless, Lahm and Humphreys were acknowledged as fully-trained pilots by the beginning of November 1909. Ironically (the cynic might say typically), the two officers who completed their training under one of the first and most famous pilots on the planet, were reassigned by the military to their original non-aviation units. Foulois, who had flown only three hours and never soloed, received appointment as the U.S. Army's first pilot-instructor.²⁶

As the Wrights were linked to the army Glenn Curtiss would soon be identified with the United States Navy, though the relationship was far from exclusive. Nevertheless, the competition between the services was matched by the rivalry between the Wrights and Curtiss. Several weeks before he inaugurated the army's flight training program, Wilbur traveled to New York. There he filed with the Federal District Court (Buffalo) a bill of complaint against Curtiss for infringing the Wright patents on airplanes.²⁷

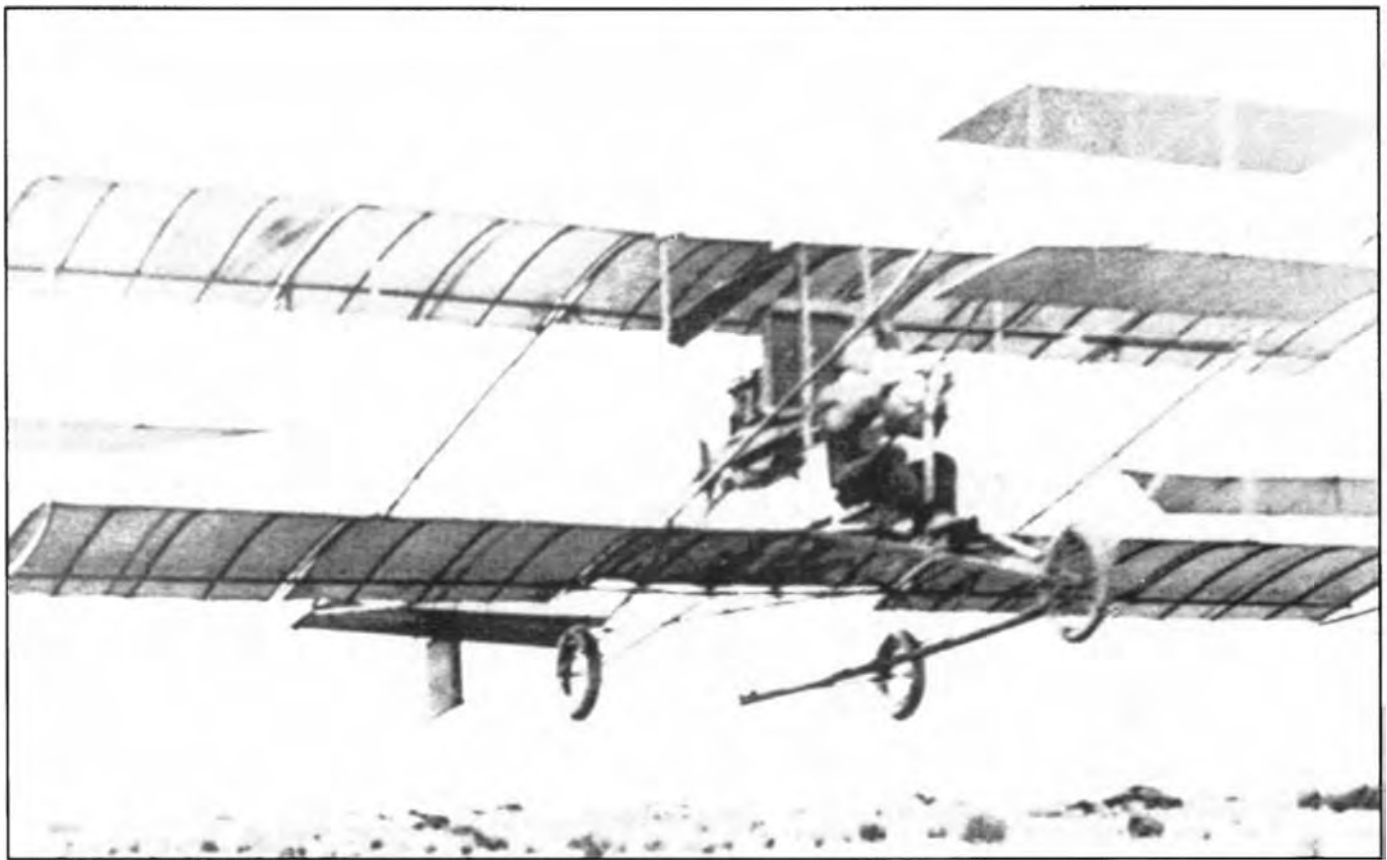
Despite being adversaries, the Wrights and Curtiss shared remarkable similarities. They were determined and analytical men and their lives and livelihood had centered as young adults on the bicycle. From the latter they acquired and nurtured a sense of balance, built strong machines from light materials, and employed engineering equipment ideal for the later creation of heavier-than-air craft.²⁸

And their parallel lives continued. Curtiss incorporated his first airplane company in 1909, the same year as the Wrights. He also established two training centers: one near his home in Hammondsport, New York; another on North Island next to San Diego, California, that served as the same type of warm weather base as the Wright facility in Montgomery. Finally, like Orville and Wilbur, Glenn focused much of his flight training attention first on the creation of a company exhibition team that could literally advance the fortunes of the new corporation.²⁹

In fact, it would be a member of the Curtiss flight team who would help cement the relationship between Curtiss and the U.S. Navy. Its leaders were very much aware of the army's interest in aviation, including procurement of an airplane and the flight training of officers. Even though the water-based service had no funds for aeronautics, Secretary of the Navy George Meyer appointed in September 1910 Captain Washington I. Chambers, an engineer, to function in the role of a clearinghouse for correspondence and information about air-



Lt. Theodore G. Ellyson shortly before "driving" a Curtiss Model D on the ground to gain a feel for the controls, January 1911. U.S. Naval Aviation Museum



Lt. Theodore G. Ellyson flying a straight course in Lizzie (Curtiss Model D), North Island, March 1911. U.S. Naval Aviation Museum

planes.³⁰

Chambers and Curtiss met next month during the Aviation Tournament held in Belmont, New York. One can easily reason the conclusions they reached during their conversations. Shortly afterward, the aviation pioneer assigned a member of his exhibition team, Eugene Ely, to fly off the deck of the USS *Birmingham*. An eighty-three foot wooden platform had been built on top of the bow of the navy cruiser.³¹

Near the Hampton Roads Navy Yard on November 14, 1910, Ely became the first person in the world to fly an airplane from a ship. His vehicle, a variation on the Curtiss No. 1 (a.k.a., *Model D*), dropped to water level once the airplane cleared the platform. The rudder and propeller nicked the water but Ely managed to fly safely the two plus miles to shore. In the process, he helped establish the principle of the aircraft carrier.³²

The success of the “stunt” allowed Curtiss to write to the Secretary of the Navy on November 29, 1910, safe in the knowledge that his letter would be carefully read. Moreover, he realized the service lacked funds for aeronautics so he made an offer the navy could not refuse. He proposed training free of charge a naval officer in both the flight and construction of an airplane. Most assuredly, Curtiss hoped that when the U.S. Navy did have money for airplanes, it would buy machines from him. And he would not be disappointed.³³

On December 23, 1910, the navy detached Lieutenant Theodore G. “Spuds” Ellyson from submarine duty at Newport News to train under Curtiss until he had acquired, in the opinion of both men, a “practical” understanding of aviation. When Ellyson caught up with his instructor on the West Coast, Curtiss had just arranged through the San Diego Aero Club to use North Island as his warm weather base of operations.³⁴

A sandy barrier island four miles long, North Island seemed ideal to Curtiss. The isolated location gave the pioneer the pri-

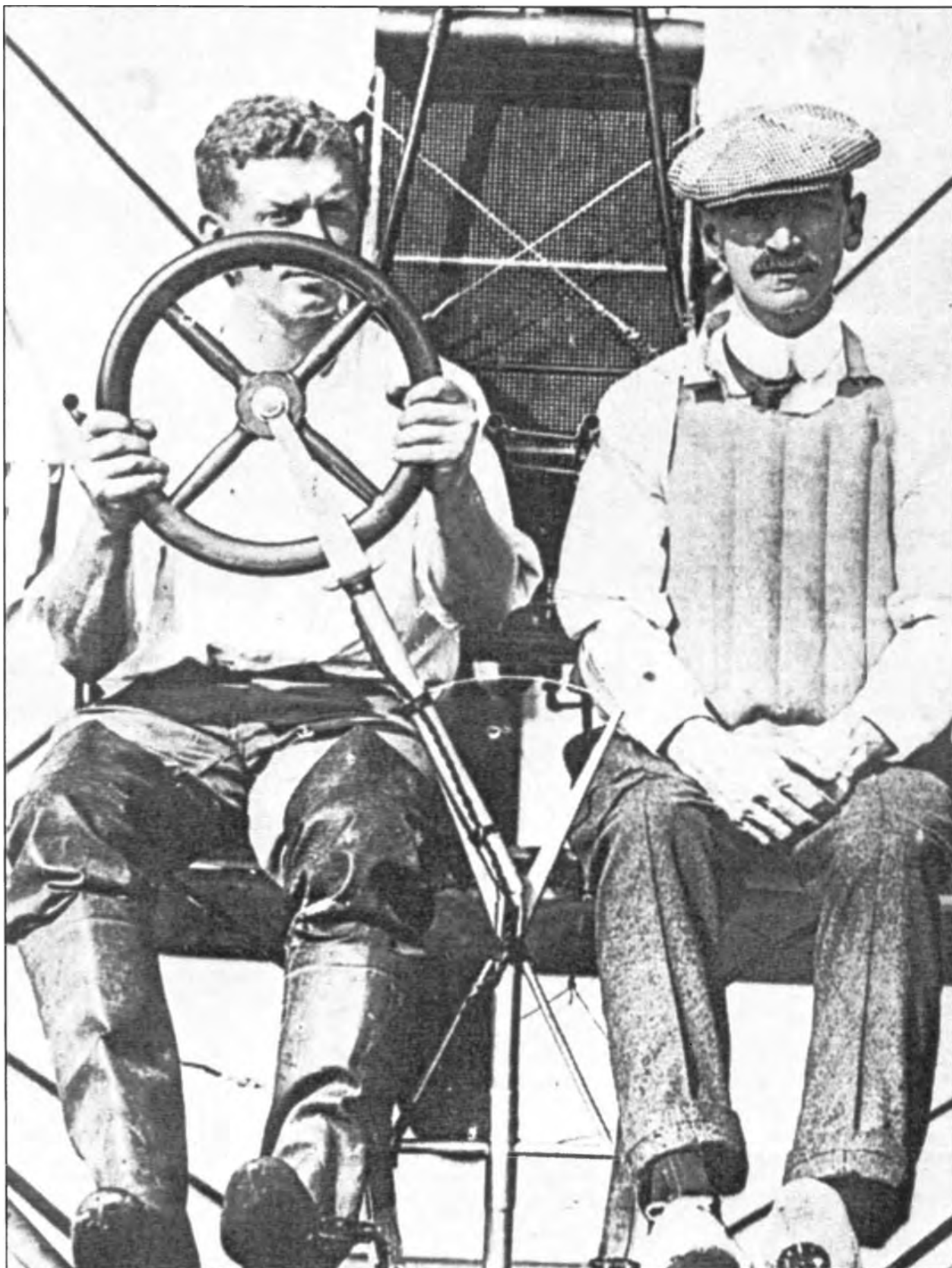
vacy he wanted. In addition, by removing some scrub, he created a lengthy runway ideal for training pilots in land-based aircraft. At the same time, easy access via a ramp to water facilitated his modification and transformation of the Model D into a “hydroaeroplane” (floatplane) he expected to sell to the U.S. Navy.³⁵

Ellyson became much more than a student to Curtiss. He helped set up the flight school/experimental station on North Island and worked alongside Curtiss in developing the hydroaeroplane, the type of hands-on work that served the role of a ground school. Couple these activities with the fact that Curtiss divided his time among air shows, demonstrations, and five other students, one can readily understand why it took the navy officer three times as long to learn how to fly as his army counterparts under Wilbur Wright.³⁶

On top of everything else, Ellyson’s training plane, a *Model D* nicknamed *Lizzie*, required numerous repairs including a crankshaft replacement that handed the machine a two week vacation. To the uninitiated, the pusher-type biplane looked similar to the *Flyer* but, despite the Wright lawsuit, possessed differences such as wheels, ailerons, and two elevators fore and aft with one of the latter normally acting as a stabilizer.³⁷

Later, Curtiss designed the *Model E* that provided side-by-side seating together with a control wheel and column that shifted between instructor and student. In January 1911, however, Ellyson learned most everything from the pilot’s seat in an aircraft powered by a four-cylinder, 25 hp engine that could carry only one person. Curtiss first taught the naval officer about the controls: the wheel and column altered the rudder and rear elevator; a pole in front of the wheel changed the forward elevator; a yoke around the pilot’s shoulders activated the ailerons; a foot pedal operated the throttle.³⁸

Flight instruction resembled the method many pioneers adopted to teach themselves how to fly. Curtiss blocked the



Lt. Theodore G. Ellyson (L) and Glenn H. Curtiss (r.) demonstrating the shifting controls on the Model E after Ellyson completed his initial training.
U.S. Naval Aviation Museum

throttle on *Lizzie* so it had enough power to roll on the ground without the possibility of taking off. Except the second time when the block fell from the plane and he flew to an altitude of fifteen feet before crash landing. Ellyson traveled back and forth on the runway. He familiarized himself with the machine and with the feel of the controls. Once he had learned to “drive” a straight line on the ground, Curtiss opened the throttle to allow for short hops at an altitude of two or three feet.³⁹

At last, the instructor set the throttle high enough for the student to experience flight over a straight course. Ellyson reported to the navy, March 1, that he had flown several times averaging a distance of four hundred feet. On March 5, he wrote his mother that he had made his first “real” flight by winging across a mile and a half of the island at altitudes ranging from ten to twenty-five feet.⁴⁰

By this time, Curtiss had rigged the hydro as a landplane. Its float had split and the pioneer decided to take advantage of its more powerful, eight-cylinder, 60 hp engine. The aircraft could carry a pilot and passenger. Before this, Ellyson and his good friend and fellow student pilot, Charles Witmer, would arrive by boat on the island at sunrise from their apartment in Coronado and take turns flying...alone. But when the naval officer demonstrated he could take off, fly, and safely land on a straight course, Curtiss took him up as a passenger and showed him how to turn the airplane.⁴¹

On the first try, it proved difficult for the student to imitate the graceful turns of his instructor. Ellyson’s winged vehicle slipped and skidded in the envelope of air and nearly crashed. Nevertheless, he soon mastered the technique and began, quite literally, flying circles around North Island. By March 31, 1911, he could report to the Secretary of the Navy that “in my opinion, and that of Mr. Curtiss, I have qualified to fly a standard eight-cylinder Curtiss biplane....”⁴²

* * * *

On balance, there are a number of interesting common ingredients found in the first military flight training programs conducted by America’s premier aviation pioneers, Wilbur Wright and Glenn Curtiss. This phenomenon can be explained by the shared backgrounds and analytical minds possessed by the men involved as well as by the logical approach one would use to teach the process of using and controlling a complex technology with attributes that are dangerous to the uninformed.

Among these common ingredients, both pioneers provided an unofficial, unplanned ground school that guided their students through the intricacies of flight and the technology of the airplane. They also initiated an orientation program that taught the officers the controls, and a feel for the controls, of an airplane. Wright and Curtiss employed an incremental form of instruction via dozens of flights so their students gradually gained skill and confidence in handling the machine.

To his great credit, Wilbur introduced the now standard dual method of flight instruction. But Glenn briefly used the same method (when the technology permitted) and within weeks after the “graduation” of his first military student, he designed aircraft with either shared or dual controls specifically for instruction. Finally, neither pioneer considered his students fully trained until they completed a series of solo flights that measured their abilities to be qualified as pilots.

Thus, in the early years of American aviation, Wilbur Wright and Glenn Curtiss established the pattern and created the traditions for the more formalized methods of flight instruction that appeared in the military with the advent of World War I and in the civilian sector with the emergence of such flight schools as the Embry-Riddle Company. □

NOTES

The author wishes to express his gratitude to the librarians and staff at the Hunt Library of Embry-Riddle Aeronautical University for assisting him in securing research materials, especially rare and out-of-print publications from the library’s Special Collections.

¹Daniel Ichbiah and Susan L. Knepper, *The Making of Microsoft* (Rocklin, CA, 1991), 14-15; Henry M. Holden with Captain Lori Griffith, *Ladybirds* (Mt. Freedom, NJ, 1991), 26-27.

²Christopher Chant, *Pioneers of Aviation* (New York, 2001), 6-35; Sherwood Harris, *The First to Fly* (New York, 1970), 38-149.

³Louis Bleriot, “Bleriot Tells of His Flight,” *New York Times* (July 26, 1909); Tom D. Crouch, *Bleriot XI* (Washington, D.C., 1982), 45.

⁴Frank J. Delear, Igor Sikorsky (New York, 1969, 1976), 37-38; Igor I. Sikorsky, *The Story of the Winged-S* (New York, 1967), 103.

⁵Edward H. Phillips, *Cessna* (Eagan, MN, 1996), 12-18; Jeffrey L. Rodengen, *The Legend of Cessna* (Fort Lauderdale, 1998), 25-31.

⁶E. D. Weeks, “Bleriot – Past and Present,” *American Aviation Historical Society Journal* (Summer 1963), 100-110; Phillips, *Cessna*, 60-77; Delear, *Sikorsky*, 57-75.

⁷Tom Crouch, *The Bishop’s Boys* (New York, 1989), 426-428; C. R. Roseberry, *Glenn Curtiss* (Garden City, 1972), 316-317.

⁸John R. McMahon, *The Wright Brothers* (New York, 1930), 208; *Orville to Wilbur Wright*, November 14, 1908, in Marvin W. McFarland, ed., *The Papers of Wilbur and Orville Wright*, Vol. 2 (New York, 1953), 936-939.

⁹Orville Wright to George A. Spratt, June 7, 1903, in Fred C. Kelly, ed., *Miracle at Kitty Hawk: The Letters of Wilbur and Orville Wright* (New York, 1972), 90-92; Harry Combs with Martin Caidin, *Kill Devil Hill* (Boston, 1979), 113-114.

¹⁰Orville Wright, *How We Invented the Airplane* (New York, 1953 and 1988), 13-21; Howard S. Wolko, ed. *The Wright Flyer* (Washington, DC, 1987), 10-17.

¹¹*Wilbur Wright to Octave Chanute*, December 6, 1909, in McFarland, *Papers*, 971; Fred C. Kelley, *The Wright Brothers* (New York, 1975), 166.

¹²Crouch, *Bishop’s Boys*, 429; Fred Howard, *Wilbur and Orville* (New York, 1987), 352-361.

¹³Signal Corps Specification, No. 486; Wright brothers’ contract with U.S. Army; United States Air Force Museum. See photocopies of these documents in Tim Brady, *The American Aviation Experience* (Carbondale, 2000), pp. 69 and 72.

¹⁴Charles deForest Chandler and Frank P. Lahm, *How Our Army Grew Wings* (New York, 1943), 163; Benjamin D. Foulois with C. V. Glines, *From the Wright Brothers to the Astronauts: The Memoirs of Major General Benjamin D. Foulois* (New York, 1968), 66.

¹⁵Crouch, *Bishop’s Boys*, 408; Chandler and Lahm, *Our Army*, 162.

¹⁶Michael J. H. Taylor, *The Aerospace Chronology* (London, 1989), 30; Lt. Lahm was the aeronaut. See Chandler and Lahm, *Our Army*, 162.

- ¹⁷Rebecca Hancock Cameron, *Training to Fly: Military Flight Training 1907-1945* (Washington, DC, 1999), 22; Chant, *Pioneers*, 14.
- ¹⁸Howard, *Wilbur and Orville*, 326. Wilbur made 20 solos and 35 instructional flights. See Arthur G. Renstrom, *Wilbur & Orville Wright* (Washington, DC, 1975), 45.
- ¹⁹Cameron, *Training*, 22-24. For an excellent description of the track and catapult system, see Combs, *Kill Devil Hill*, 243.
- ²⁰A complete record of the flights near College Park is given in the letter from James Allen to E. L. Jones, November 9, 1909, 19331, Record Group 111, National Archives.
- ²¹Murray Rubenstein & Richard M. Goldman, *To Join with the Eagles* (Garden City, 1974), 11. For the evolution of Wright engines, see Leonard S. Hobbs, "The Wright Brothers" *Engines and Their Design* (Washington, DC, 1971).
- ²²Walter T. Bonney, *The Heritage of Kitty Hawk* (New York, 1962), 67; Sherwood Harris, *The First to Fly* (New York, 1970), 156.
- ²³Allen to Jones, November 9, 1909; *Cameron, Training*, 24.
- ²⁴Frederick E. Humphreys, "The Wright Flyer and Its Possible Uses in War," *Journal of the United States Artillery* 33 (Mar-Apr 1910), 144-147; Frank P. Lahm, "Early Flying Experiences," *Air Power Historian* 2 (Jan 1955), 1-10.
- ²⁵Foulois, *Wright Brothers*, 68; Chandler and Lahm, *Our Army*, 164-165.
- ²⁶Ironically, the last day of flight training, November 5, 1909, Lahm and Humphreys flew together. During a turn at low altitude, they caught the left wing tip on the ground and cartwheeled. The airplane was damaged beyond immediate repair, but the pilots were not injured. Foulois, *Wright Brothers*, 68.
- ²⁷Renstrom, *Wilbur and Orville*, 44-45; Howard, *Wilbur and Orville*, 328.
- ²⁸Crouch, *Bishop's Boys*, 15-16 and 104-115; C. R. Roseberry, Glenn Curtiss (Garden City, NY, 1972), 11-13 and 406.
- ²⁹Lyman J. Seely, *Flying Pioneers at Hammondsport*, New York (Auburn, NY, 1929), 33; Alden Hatch, Glenn Curtiss (New York, 1942), 208.
- ³⁰Staff of Naval Aviation News, *Naval Aviation Training* (Washington, DC, 1987), 3; Robert L. Lawson, ed., *The History of US Naval Air Power* (New York, 1985), 10.
- ³¹David Wragg, *Wings Over the Sea* (New York, 1979), 11-12; Rubenstein & Goldman, *Eagles*, 23-24; R. D. Layman, *Before the Aircraft Carrier* (Annapolis, 1989), 107-108.
- ³²Sandy Russell, ed., *Naval Aviation 1911-1986* (Washington, DC, 1986), 2; Brian Johnson, *Fly Navy* (New York, 1981), 12-13.
- ³³Roseberry, Glenn Curtiss, 296; Staff of Naval Aviation News, *Aviation Training*, 3.
- ³⁴Clara Studer, *Sky Storming Yankee: The Life of Glenn Curtiss* (New York, 1937 and 1972), 249; Robert Scharff and Walter S. Taylor, *Over Land and Sea: A Biography of Glenn Hammond Curtiss* (New York, 1968), 175.
- ³⁵Curtiss Aeroplane and Motor Company, Inc., *Curtiss Aeroplanes* (Hammondsport, NY, 1912), 7; Louis S. Casey, *Curtiss: The Hammondsport Era 1907-1915* (New York, 1981), 73-81.
- ³⁶Roseberry, Glenn Curtiss, 312; George van Deurs, *Anchors in the Sky: Spuds Ellyson, the First Naval Aviator* (San Rafael, CA, 1978), 57-67.
- ³⁷The most thorough discussion of the *Model D* can be found in Casey, *Curtiss*, 73-81. See also Robert B. Casari, *Encyclopedia of U.S. Military Aircraft, Vol. 2* (Chillicothe, OH, 1970), 1-12.
- ³⁸Peter M. Bowers, *Curtiss Aircraft, 1907-1947* (London, 1979), 41; Curtiss Aeroplane and Motor Company, Inc., *Curtiss Aeroplanes*, 10.
- ³⁹Staff of Naval Aviation News, *Aviation Training*, 3. A complete description of the Glenn Curtiss approach to flight training is found in Glenn H. Curtiss and Augustus Post, *The Curtiss Aviation Book* (New York, 1912), 235-253.
- ⁴⁰Ellyson to US Navy Department, March 1, 1911; and Ellyson to his mother, March 5, 1911; both reprinted in van Deurs, *Anchors in the Sky*, 75.
- ⁴¹*Ibid.*, 82.
- ⁴²Ellyson to US Secretary of the Navy, March 31, 1911, reprinted in *Ibid.*, 83.

The Author:
Dr. James K. Libby



James K. Libbey holds a Ph.D. in history and is the author of numerous publications. He teaches American aviation history at Embry-Riddle Aeronautical University.