



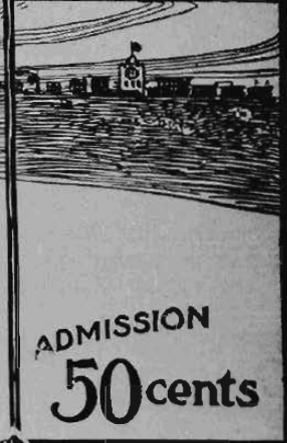
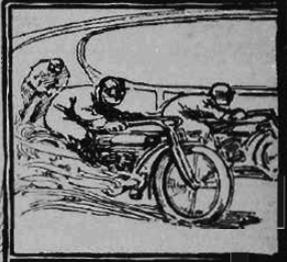
4 BIG DAYS

TWIN CITY JUNE 22, 23, 24, 25

AVIATION

MEET

**STATE FAIR GROUNDS
MINNEAPOLIS - ST. PAUL**



*Curtiss, Willard, Mars, Harmon,
Oldfield, Kirscher, Minor Heir*

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THE BIRTH OF POWERED FLIGHT IN MINNESOTA

Gerald N. Sandvick

AVIATION in Minnesota began in the first decade of the 20th century. It was in many ways typical of the early patterns in flying development that were unfolding elsewhere in the nation. Several Minnesotans received publicity for flying machines that, in the end, were more fantasy than fact; some made glides or powered hops, and a few at early dates made true powered flights. The public, however, saw flying only when Glenn H. Curtiss and other renowned aviators visited the state to display their skills. Early exhibitions, mostly staged at the state fairgrounds located between Minneapolis and St. Paul, were immensely popular, since in 1910 flying was considered more as entertainment than as transportation. From that year on flying became increasingly commonplace, but the public never lost its fascination with airplanes and the men and women who flew them.

¹On early balloon flights see, for example, Rhoda R. Gilman, "Pioneer Aeronaut: William Markoe and His Balloon," and Maria B. Dunn, trans., "Zeppelin in Minnesota: The Count's Own Story," both in *Minnesota History*, 38:166-176, 40:276 (December, 1962, Summer, 1967).

²*Minneapolis Journal*, August 14, p. 6, and 18, p. 7, 1906.

Gerald Sandvick is a faculty member of North Hennepin Community College in Brooklyn Park, where he teaches political science and aviation history. He is a member of the Twin City Aero-Historians, the American Aviation Historical Society, the Air Force Historical Foundation, and the American Society for Aero-Space Education.

Aviation can be broadly divided into two areas: aeronautics or heavier-than-air flight, and aerostation or lighter-than-air vehicles such as balloons and dirigibles. It was in balloons that man first took to the air when the Montgolfier brothers, Joseph and Étienne, began flying hot-air balloons in France in 1783. For nearly 125 years ballooning was the only means of flight, and the first flying in Minnesota was done in a balloon. In 1857 William Markoe, a St. Paul real-estate investor and amateur scientist, flew from St. Paul to near Cannon Falls in a gas-inflated balloon of his own construction. Five years afterward, Count Ferdinand von Zeppelin made his first balloon ascension in St. Paul; he later claimed that "it was there that the first idea of my Zeppelins came to me."¹

By the turn of the century a balloon or dirigible flight was considered a necessary attraction for large public gatherings. In 1906 the Grand Army of the Republic, a group of Civil War Union Army veterans, held its national encampment in Minneapolis. As a part of the event, the famous dirigible flyer Charles K. Hamilton made two flights over the city in his 60-foot-long airship. At altitudes of 500 to 1,000 feet and for up to two hours in the air, Hamilton caused the whole city to stop and watch on August 17 when he circled the courthouse in a spectacular exhibition of skill with an airship.²

Aeronautics means heavier-than-air and, by definition here, powered flight. The first of these was made in December, 1903, by Wilbur and Orville Wright over the wind-swept dunes of Kitty Hawk, North Carolina. Only

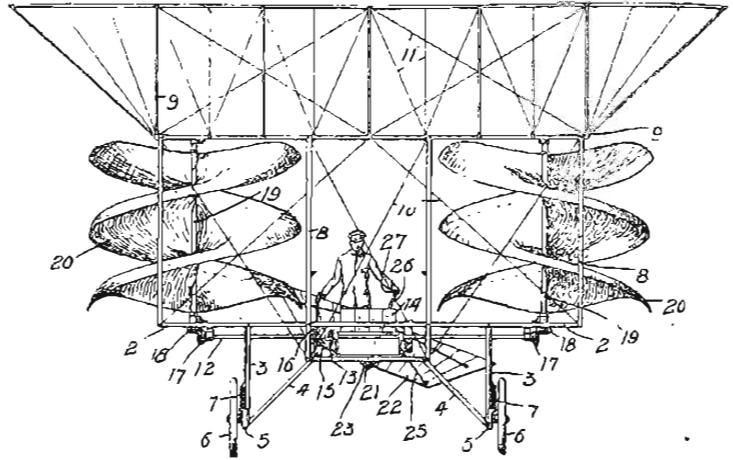
a handful of witnesses saw this historic flight, and the Wrights proved to be uncommonly shy of publicity; it was not until 1908 that the public really became aware of their activities.³

Public enthusiasm over aeronautics exploded on the scene in 1910. The first air show ever was held at Reims, France, in August, 1909, where more than 200,000 people paid to see Europe's most celebrated aviators take to the air. In the next several months dozens of air meets were held. The first of these in America occurred in January, 1910, at Los Angeles; thereafter, no self-respecting city wished to be without its own demonstration of the science of aviating. Newspaper reporting inspired people in all parts of the nation to dream up their own flying machines, so both the air shows and local inventors were a part of the aviation scene by 1910. That year in Minnesota was marked by two major developments: air shows where the public saw flying for the first time and early successful flights by local aviators in their homemade machines.

The birth of aeronautics in the state, however, was preceded by partial successes, failures, and flights of fancy. One of the earliest home-grown designs for a heavier-than-air machine proved more whimsical than flyable, despite the fact that it was actually patented. Designed in 1907 by a Minneapolis druggist named Edward M. LaPenotiere, the device was intended to take off straight up by means of two screw-shaped fans, mounted vertically and powered by a gasoline engine. The wing was to be a series of louvered aluminum blades which would be vertical as the machine ascended. At the desired altitude the engines would be shut down, air pressure would close the blades to form a solid horizontal wing, and the craft would glide to the earth. LaPenotiere had learned aeronautics by watching birds fly and was confident of the success of his machine. He did not, however, decide on the type of fans to be used, did not build a model to test his ideas, and did not know when such a machine could be built. He did know that it would be expensive.⁴

Even more imaginative was the hybrid helicopter-balloon envisioned by Oliver K. Chance of Minneapolis. Described as "a scalp specialist and an airshipist" who had "solved the problems of aerial navigation," Chance designed a craft consisting of a large aluminum saucer under which a gas bag would be placed to provide lift. Hanging ten feet under the balloon was to have been a basket or car which would carry no less than the pilot, the required operating levers, a 50-horsepower engine, and still have room for five passengers. Three propellers and a system of rudders would give maneuvering ability. A long shaft, running from the engine in the control car to the top of the device, would turn a large horizontal propeller to control ascent and descent.⁵

Chance was nothing if not confident. The utility of



THE FLYING MACHINE designed by Edward LaPenotiere and described as "an airship like a bird's wing"

the aluminum saucer, he said, was that if one were up in the air "ever so many miles" and the engine quit, it would act as "such an admirable parachute that it will require quite two hours and thirty-seven minutes to regain terra firma." A printed advertisement promised that his machine "ascends and descends vertically. It balances. It hovers. It lands lightly like a feather. It is perfectly safe. Its lifting power is immense. Its speed is phenomenal."

Chance evidently did build demonstration models, one of which was smashed in an encounter with a wall, but no full-scale device was built. His attempt to sell stock to finance construction of one came to nothing. It is doubtless of significance that when asked if he had any practical experience at aviating, Chance replied, "Bless my soul, no! . . . It would not be safe."

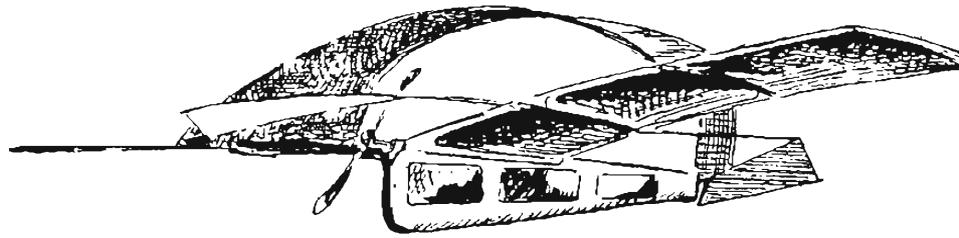
An aircraft design by Minnesotan E. H. Eichenfeldt received a measure of international recognition when it was included in the 1909 edition of the prestigious directory, *Jane's All The World's Airships*, published in London. Eichenfeldt, born in Minneapolis and a resident of Mankato, had received a patent on a unique biplane which had a curved upper wing that arched into the upward angled lower wing. A 25-horsepower motor was intended to be mounted on the front, and a rudder in the rear allowed steering. The device would weigh 510 pounds and be constructed of steel tubing covered with sheet aluminum. Eichenfeldt built at least four models of his design and flew them successfully, on occasion in the

³ Here and below, see Charles H. Gibbs-Smith, *Aviation: An Historical Survey from its Origins to the End of World War II*, 152-158 (London, 1970).

⁴ *Minneapolis Sunday Journal*, August 11, 1907, sec. 1, p. 6.

⁵ Here and two paragraphs below, see *Minneapolis Sunday Journal*, November 29, 1908, sec. 1, p. 7.

A SKETCH of the unusual biplane designed by E. H. Eichenfeldt but apparently never manufactured



assembly room at the Minneapolis courthouse. A full-scale version was not built, however, and Eichenfeldt's idea vanished into obscurity.⁶

The variety of flying machine ideas seemed nearly endless. In early 1910 B. W. Tall, a Minneapolis barber, invented an "aerocycloplane," which involved two engines, ten wings, and a gyroscope. A contemporary newspaper account said the machine was "still in the blueprint stage," where it seems to have remained. By 1910, however, the first tentative steps off the ground had already been taken by local inventors. Two years earlier, for example, in October, 1908, Robert and Henry Robertson, twin brothers from the Lynnhurst area of Minneapolis, made glides that were at least partially successful. The brothers constructed a kite-like glider of fabric and wood with which they seem to have managed a few short glides. Such was the fervency of interest in flying that the *Minneapolis Journal* called the kite "the first experiment in real aviation in Minneapolis" and breathlessly proclaimed that the Robertson brothers "may rank with Montgolfier, Zeppelin, [and] the Wright brothers."⁷

⁶ *Minneapolis Journal*, April 29, 1909, p. 7.

⁷ *Minneapolis Tribune*, February 21, 1910, p. 2; *Minneapolis Journal*, October 20, 1908, p. 4.

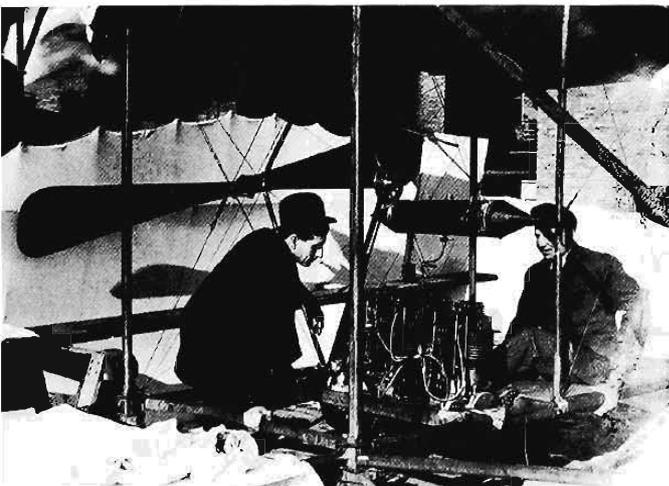
⁸ Here and two paragraphs below, see *Minneapolis Journal*, October 17, 1908, p. 2; *Minnetonka Record* (Excelsior), January 29, 1909, p. 1; *Minneapolis Star*, March 17, 1953, p. 17; *Minneapolis Sunday Journal*, February 27, 1910, pt. 2, p. 1.

The age of powered flight in Minnesota had something of a false dawn in early 1909. Using a machine of their own construction but clearly patterned on the Wright biplane, Ralph D. Wilcox and Ashley C. Bennett attempted to get airborne off the ice on Lake Minnetonka. Wilcox was a member of a prominent Minneapolis family involved in various manufacturing enterprises, including trucks and automobiles; Bennett, who seems to have designed the machine, was a business associate. They built the aircraft in the shops of a family business, the H. E. Wilcox Motor Car Company on Marshall Avenue Northeast in Minneapolis, in the autumn of 1908. Resembling the Wright brothers' machines in both size and general layout, the Wilcox-Bennett aircraft was powered by a 25-horsepower, four-cylinder, air-cooled engine that turned a single pusher propeller. The control system they used is unrecorded.⁸

In late January, 1909, the two men, with Ralph's brother Harry watching, tried to fly near the family's summer home on Lake Minnetonka. The machine was lashed to a tree with a rope, the engine run up, and the rope released. The biplane made a short run downhill on an iced runway and hopped into the air. In later years, Harry Wilcox recalled that the machine "barely got into the air. I've seen skiers go higher." At least two attempts a few days earlier had failed because of engine problems, and even the hop that was completed did not attract much newspaper attention at the time.

A year later Wilcox and Bennett tried again with

A. C. BENNETT (left) and Ralph Wilcox, shown working on their aircraft about 1907, and (right) the Wilcox-Bennett flying machine as it rose from the ice on Lake Minnetonka in 1909



essentially the same aircraft, but using a more powerful eight-cylinder engine. They may have accomplished further hops, but more engine and propeller troubles prevented sustained flights. In any event, after their second try at flying, the two men abandoned aviation.

The winter of 1910 saw not only Wilcox and Bennett's second try but also, across the Twin Cities from Lake Minnetonka, boatbuilder John O. Johnson managed to stagger briefly into the air from the frozen surface of White Bear Lake. The 600-pound machine of Johnson's design and construction was powered by a 20-horsepower engine. The wing span was 30 feet but, interestingly enough, the wings were placed one behind the other rather than in the common configuration of one above the other — an arrangement tried by others, most notably the aeronautic pioneer, Samuel P. Langley, in Washington in 1903. It failed for Langley and worked only slightly better for Johnson.⁹

On the afternoon of January 25 several bystanders gave Johnson's machine a push as he revved the engine. Although accounts vary slightly, he flew no more than 200 feet; his altitude was probably 20 feet when the engine quit, and he made a hard landing on the ice, doing major damage to the propeller, rudder, and landing skids. Johnson was clearly a man not lacking in self-confidence, and his evaluation of the affair was to "feel encouraged by my first success, for I did prove that I had the right idea and that I can fly as well as those fellows who have been winning medals all over the world." A few weeks later he announced plans to build a monoplane that he believed would mark a new era in aerial navigation and put the Wright brothers to shame. Self-assurance seems to have been all that came of it, however, and Johnson faded from the aviation scene after his one powered hop.

The endeavors of Wilcox, Bennett, and Johnson mark the first attempts at true airplane flight in Minnesota. In both cases their machines left the ground, but in neither case was a true flight accomplished, largely because adequate power and control systems were lacking.

IT IS IMPORTANT to understand in examining the origins of aviation just what is meant by a successful flight. It requires an effective control system in addition to a practical source of power. An aircraft moves through three axes during flight: pitch, yaw, and roll. Many early builders did not understand the necessity of controlling movement in all three directions.

Perhaps the major criterion for calling a particular flight successful, however, is whether it was sustained and not simply a powered hop off the ground. If an aircraft is launched downhill or uses a mechanical assist such as a catapulting device, a certain distance will likely be covered through the air simply due to imparted momentum. A noted British aviation historian has sug-

gested that for this early period a flight be defined as one that accomplished a distance of about a quarter mile (about 1,300 feet).¹⁰

The choice of a quarter mile is, quite obviously, arbitrary, but it represents a sensible standard all the same. If a machine could travel a quarter mile in the air, it had gone a distance well beyond that for which momentum alone could account, and its own propulsion system must have been of help. It is also unlikely that a machine could fly such a distance without being under some degree of reasonably effective control. Without it the craft would most probably stall, dive, roll, or slew into the ground after a few dozen feet at most.

The quarter-mile criterion therefore represents a realistic distance for a day in which engines were balky and control was a trial-and-error learning process. Several successful aviators, including the Wrights, did accomplish this distance with relative ease in their early experiments. But by this standard, Wilcox, Bennett, and Johnson did not succeed.

One Minnesota-built machine that seems to have succeeded took to the skies in November, 1909. Norwegian-born Oliver A. Rosto, employed as a chauffeur in Duluth, was probably inspired to aviation by Louis Blériot's flight across the English Channel. In July, 1909, Blériot had flown the 20-odd miles from his native France to the English coast near Dover in a monoplane of his own design. It was an event widely reported in newspapers everywhere, and Rosto apparently built a close copy of Blériot's ship.^{10a}

He incorporated an identical control system and the same type of three-cylinder, air-cooled Anzani engine that the Frenchman had used with success. Although the details are imprecise, it appears that Rosto did get airborne from the frozen surface of Duluth's harbor in a flight that may have lasted for 20 minutes. In later years Rosto said that conditions were ideal and that he "had no difficulties in getting the plane into the air."

THE AGE of powered flight arrived in Minnesota in a more public fashion during four sweltering days in June, 1910. Thousands of people flocked to the state fairgrounds and endured heat, humidity, and heavy rainstorms to see Minnesota's first air show. They witnessed

⁹Here and below, see *St. Paul Dispatch*, January 27, 1910, p. 5; *White Bear Life*, January 28, 1910, p. 1.

¹⁰For a definitive statement of what flight is and who first accomplished it, here and below, see Charles H. Gibbs-Smith, *The World's First Aeroplane Flights (1903-1908) and Earlier Attempts to Fly*, 3-6 (London, 1965).

^{10a}Rosto to E. A. Goff, March 6, 1962, in biographical files, National Air and Space Museum, Washington, D.C. See also Rosto obituaries, *San Francisco Chronicle*, p. 38, and *Los Angeles Times*, part 1, p. 28, both for April 13, 1972. [This information was found after the manuscript first went to press. Ed.]

flights by several prominent aviators, but the star of the show was Glenn Curtiss himself, one of America's greatest aviation pioneers.

Experience had shown that there was money to be made from the airplane as a new form of entertainment, and promoters were not slow to capitalize on it. The first major American air meet had been held in January, and for the next many months aerial spectaculars were common throughout the country. There was something in it for everyone. Huge crowds and commensurate gate receipts attracted promoters, and fees plus prize money lured the aviators. It was not impossible for a flyer to earn from \$5,000 to \$20,000 for making a few flights on an afternoon or two. The paying customers got to see airplanes in flight and, since public knowledge of aviation was still simple and unsophisticated, they only wanted to see how fast, how high, and for how long an airplane could fly — and, perhaps, whether the aviator could do it all without getting killed.¹¹

Minnesota's air show began to take shape in February, 1910. At that time Carson N. Cosgrove, secretary of the Minnesota State Agricultural Society that sponsored the fair, entered into serious negotiations with various exhibition flyers, including the French aviator, Louis Paulhan. The only European pilot making a splash in this country, Paulhan was an enormously colorful figure; he had appeared at the Los Angeles air meet, where he quickly had become the darling of the crowds. He traveled with his wife, two mechanics, two Farman biplanes, two Blériot monoplanes, and a poodle. He was also a superb pilot, and his \$19,000 of prize money in California topped the winnings of any other aviator there.¹²

Cosgrove tried to get Paulhan to come to Minnesota but was informed that the Frenchman wanted a guarantee of \$12,500 plus 75 per cent of the gate receipts. A certain amount of haggling followed, but Paulhan's appearance became a moot point when a federal marshal served him with an injunction requiring a \$25,000 bond against any exhibition earnings. The Wright brothers had convinced the court that Paulhan's flying was an

infringement on their patents and that royalties were due them. Paulhan was furious. He cancelled further exhibition flying in this country, thumbed his nose at the Wrights by flying free for all to see over New York, and went back to France in a huff.

By mid-March Cosgrove was negotiating with the Curtiss exhibition people in the hope of promoting an air show in June. Cosgrove had competition, however, because the Minneapolis Automobile Show Association was also interested. The association had been sponsoring auto shows for several years, and its officers were prominent Minneapolis businessmen including Harry E. Pence, Harry Wilcox, and Frederick E. Murphy, all involved in the auto business. In late March both Cosgrove and the auto association manager, Walter R. Wilmot, had gone to Chicago to try to conclude an agreement for the Curtiss aviators to appear in Minnesota. Wilmot made a verbal agreement with Curtiss representative K. L. Bernard, which provided that Glenn Curtiss and two other pilots would fly in the Twin Cities from June 22 through 25. The price would be \$20,000 plus a percentage of the gate.¹³

Cosgrove, it seems, conducted separate negotiations with Bernard and was offered a similar deal in the event Wilmot and his association turned it down. They did not, however, and on March 25 Bernard confirmed the agreement in writing. With the air show now guaranteed, the fair board and the auto show group quickly agreed to co-operate, probably because while the latter owned the contract, the former owned the only feasible place to hold such a show. A memorandum was signed in mid-May with the two parties agreeing to a division of the gate receipts after the Curtiss team had been paid.¹⁴

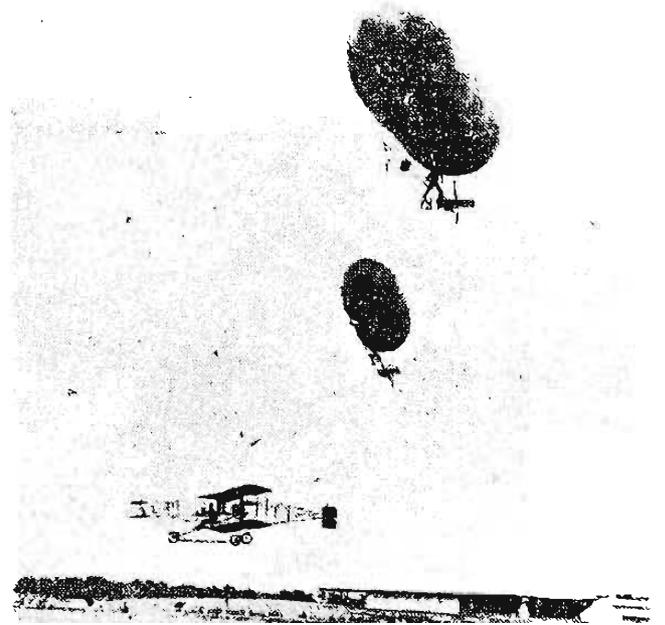
Having assured themselves of the flying, the promoters went on to create not just an air show but a four-day extravaganza. To keep the aerial activity going, they hired dirigibles to fly along with the airplanes. On the

THE BIPLANE of Glenn Curtiss, taking to the air as dirigibles hover above the Minnesota state fairgrounds

¹¹Curtis Prendergast et al., *The First Aviators*, 91 (Alexandria, Va., 1980).

¹²Here and below, see *Minneapolis Journal*, February 28, 1910, p. 11; Prendergast, *First Aviators*, 91. The Blériot and Farman planes were named for their French designers, Louis Blériot and Henri Farman.

¹³K. L. Bernard to Wilmot and to Cosgrove, both dated March 25, 1910, Minnesota State Fair Board Records, Contracts for 1910, St. Paul. An interesting contractual detail was the Curtiss insistence that only aircraft approved by that firm could be exhibited, an obvious effort to exclude any Wright machines. In return, Curtiss promised to make no other flights within 100 miles of the Twin Cities before July 1, 1910. Contract between Curtiss and Cosgrove, April, 1910, Fair Board Records.



ground, automobile and motorcycle races were scheduled, one of the car drivers being no less than the legendary Barney Oldfield. Just for good measure, a steed named Minor Heir, billed as the fastest horse in the world and a stable mate of M. W. Savage's famous Dan Patch, was hired to race against the newer mechanical modes of conveyance.

PUBLIC INTEREST in flying had been high for months. As far back as February the *Minneapolis Journal* reported that a favorite 1910 Valentine's Day card carried the verse:

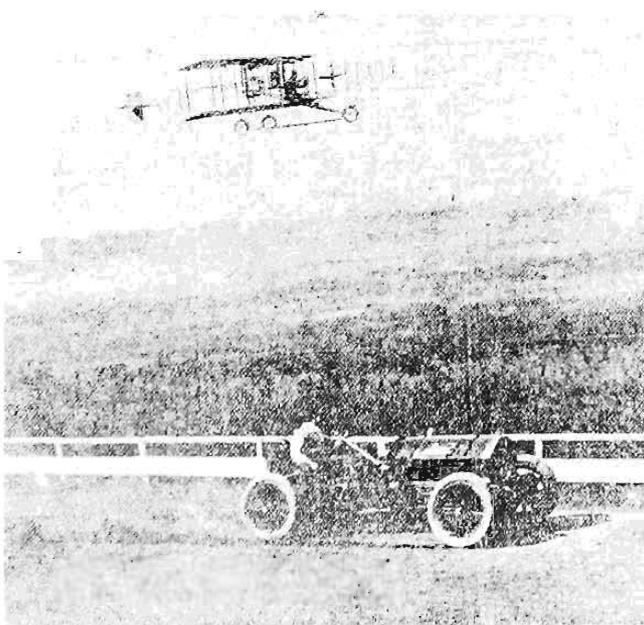
Come, my dear, and fly with me;
 You my Valentine will be;
 We'll sail up in my aeroplane,
 And our hearts will ne'er be twain.¹⁵

Though possibly less than profound poetry, such verse evidently struck a popular chord.

As the date for the air show neared and it became clear that Minnesotans would finally see airplanes in flight, the newspapers became almost rapturous. One editor held that the airplane was the most inspiring of all vehicles and would soon be on par with the automobile and motorboat, because it would be incomparably superior to travel through "the clean, fresh, dustless roads of the air!" Flying would provide "boundless room on every side, with the countryside spread out like a green and alluring map, with no mountains or valleys, no rivers or ravines to conquer, save those as yet mysterious configurations of the atmosphere."¹⁶

By June excitement about the air show was intense.

THE RACE between aviator Curtiss and famed automobile driver Barney Oldfield, June 25, 1910



The *Minneapolis Journal* altruistically reported that the meet was "intended to promote and stimulate interest in aviation from an educational standpoint, rather than to simply furnish sensational spectacles." A few days later, though, the paper could hardly contain itself when it opined that "the twin cities and the northwest are upon the eve of beholding what will doubtless prove the most stupendous spectacle of the kind ever seen in this section of the country."

The show began at the state fairgrounds on June 22, a Wednesday, and lasted through Saturday. Auto and motorcycle races, while exciting, were no novelty, and the scheduled dirigible races caused little stir. The time was passing when dirigibles could compete with airplanes, and a "race" between dirigibles was really a euphemism for two partially controllable gas bags heading in more or less the same direction at approximately the same time of day. In any case, dirigibles had flown over the Twin Cities before. It was the airplanes that absorbed the public's attention.

The day before the show started fully half a dozen pilots with their aircraft and spare parts had arrived. This was one of the largest concentrations of aviators that North America had ever seen. Glenn Curtiss was the center of attention. The first American other than the Wright brothers to fly, he had become a designer and builder of aircraft and the premier exhibition pilot. The team that came with him consisted of Charlie Willard, J. C. "Bud" Mars, and Lincoln Beachey. Willard was the first man Curtiss had taught to fly, and Mars had come aboard at an early date, too. Both were already famous and as experienced as aviators could be in 1910. Lincoln Beachey was the newcomer to the Curtiss team and still considered something of a student during his Minnesota appearance. Within another year, though, he would be known as the most skilled and daring of all the exhibition flyers; even Orville Wright would later call Beachey "the greatest aviator of all" with whom no other flyer could compare.¹⁷

For Eugene B. Ely the Minnesota air meet was the turning point of his career. He owned a Curtiss airplane but was just breaking into the air show business, and this

¹⁴ Here and below, see Memorandum of Agreement between Minnesota State Agricultural Society and F. E. Murphy, May 17, 1910, Fair Board Records, *Minneapolis Journal*, June 22, 1910, p. 1. Minor Heir was later withdrawn from the race because of the possibly damaging effect of airplane noise on him.

¹⁵ *Minneapolis Sunday Journal*, February 13, 1910, sec. 2, p. 2.

¹⁶ Here and below, see *Minneapolis Journal*, June 14, 1910, p. 4; *Minneapolis Sunday Journal*, May 29, sec. 1, p. 9, and June 19, part 8, p. 10, both in 1910.

¹⁷ Sherwood Harris, *The First to Fly*, 282 (New York, 1970). Mars was a pseudonym for James D. McBride of Grand Haven, Mich.



GLENN CURTISS,
seated at the controls
of a biplane powered
by an early V-8
engine

was only his second appearance. Born in Davenport, Iowa, Ely was working in Portland, Oregon, in early 1910 when a local automobile dealer acquaintance bought one of the first Curtiss airplanes. Having purchased it, however, the man was afraid to fly it, so Ely volunteered and immediately smashed it. Being mechanically inclined, he repaired the machine and cautiously taught himself to fly, acquiring the feel of flight as he went along. By the spring of 1910 he was flying well and decided to try to make money at exhibition flying. He made two successful flights at a show in Winnipeg and then moved on to the Twin Cities.¹⁸

He thus met Willard, Mars, and especially Curtiss, who was always looking for new exhibition flyers. Liking Ely and being impressed with his work, Curtiss signed him to the team. For several months Ely flew shows for Curtiss and in November, 1910, made history when he became the first pilot to take off from a ship. Curtiss had arranged the demonstration for the navy, and it marked the birth of the aircraft carrier. Ely's career, like that of many exhibition pilots, was not a long one. He died in

¹⁸On the aviators here and two paragraphs below, see Harold E. Morehouse, "Flying Pioneers," unpublished, undated biographical sketches in National Air and Space Museum; *Minneapolis Journal*, June 20, 1910, p. 9.

¹⁹Here and two paragraphs below, see *Minneapolis Journal*, June 22, 1910, p. 1; *Minneapolis Tribune*, June 23, 1910, p. 1, 2.

the crash of a Curtiss airplane in October, 1911, at Macon, Georgia, just two days short of his 25th birthday.

The somewhat obscure figure of Whipple Hall completed the list of flyers. An independent aviator flying a Curtiss-built machine, Hall's main claim to fame seems to have been his billing as the "heaviest aviator in the world." At 210 pounds he would have greatly strained the flying machines of those times, and although he tried mightily indeed, he could not get off the ground in Minnesota's summer heat.

THE AVIATION EVENT opened on June 22 with auto and motorcycle races, but it was the airplanes that had attracted the crowd of 18,000. Six machines were ready to fly and were surrounded by curious throngs of spectators who inspected the "monstrous looking machines, great of sweep of wing, and frail of support and frame work, their motors seemingly hung to a nothingness of silk and bamboo and wire." Around 4:00 P.M. Curtiss' aircraft was readied for takeoff from the inner race track area in front of the grandstand. As his engine crackled and he began to roll, the crowd stood up to catch every move of the first airplane flight in the state. A huge cheer went up as Curtiss left the ground. He attained an altitude of 50 feet when strong gusts forced him down to an inelegantly hard landing which damaged the machine. He had flown about half a mile, never leaving the infield.¹⁹

It was hardly an auspicious flight for Glenn Curtiss, who had won \$10,000 less than a month earlier for a 150-mile flight from Albany to New York. Still, it was the first public demonstration of flight in Minnesota, and the crowd loved it. Mars and Ely each tried twice and failed, but by 6:00 Curtiss' machine had been repaired. He again flew about half a mile and not over 50 feet high, but this time his aircraft nosed into the ground and cart-wheeled. Curtiss climbed out of the debris unhurt, but his machine was a wreck.

The whole problem had been the weather. The temperature had reached 96 degrees with winds gusting to 15 miles an hour, and the grandstand at the fairgrounds was compared to the "fire box of a bake oven with all the drafts open." Curtiss said "This is absolutely the most difficult aviating I ever attempted. . . . Conditions were never worse for flying than they are right here today." However modest they may have been, the first flights over Minnesota were now history, and the aviators promised that with improved atmospheric conditions they would really show what flying was all about.

The second day of the meet saw the hot gusty weather continue, but the flying improved greatly. Curtiss led off with a flight that left no doubt about his conquest of the air. A crowd of 12,000 saw him fly for nearly ten minutes at up to 700 feet as he dipped and circled in front of the grandstand, moved out over Machinery Hill and on toward Lake Johanna. He covered well over six ground miles and left the crowd in such amazement that they could scarcely believe what they were seeing. When he landed, "Men and women in the grandstand yelled themselves hoarse, threw their hats into the air and clapped their hands." It was a remarkable flight under the conditions, and Curtiss' success was due to his change of aircraft. Having wrecked one machine the previous day, he now switched to the Hudson Flyer, the same aircraft in which he made his historic Albany-New York flight. The Flyer had a 50-horsepower, V8 engine, while the other machines present had 4-cylinder engines of 25 or 30 horsepower. The extra power made all the difference in the blistering weather.²⁰

Mars made a short flight of perhaps a mile, but Hall, Ely, and Beachey failed to get off the ground at all. Ely drew more comment on his natty white suit than on his attempt to fly, and Beachey was having his troubles with an experimental monoplane. To give the people their money's worth, Curtiss agreed to fly a second time. He made a spectacular flight of about five minutes' duration, circling the grandstand and flying out to the northwest of the fairgrounds. On his landing, the crowd again went wild. Curtiss was typically modest, saying that his flying was not really very much and that if there were more moisture in the air he could do much better. He also commented that "Minnesota has a fine climate to live in, but it is worthless for airship flying."

On Friday, June 24, the third day of the aerial spectacular, Charlie Willard finally made a successful, albeit brief flight, and again Mars, Hall, and Ely just could not arise in the gusty 94-degree heat with four-cylinder engines. Lincoln Beachey's efforts to get his monoplane off the ground were unavailing; late in the day after the crowd had gone, he wrecked his machine against a fence in trying one last takeoff.²¹

Curtiss made up for these disappointing tries by doing the show's best flying. A lightning storm that moved through the cities in midafternoon kept the crowd smaller than on the previous days, but Curtiss rambled confidently around the clouds, completing four flights. His machine was described as "majestically proud" although scarred with the "wounds of many encounters with . . . obstacles in its path." After two perfectly controlled flights of about four minutes each, he flew a third time for an incredible ten minutes. Flying north to Lake Johanna, Curtiss then circled west and south of the fairgrounds. Coming back he did a bit of "fancy flying" in front of the grandstand and even buzzed a chatting group of auto drivers and newsmen, which caused some to hit the ground and the rest to flee. He had covered more than nine miles and made flying look almost routine. Then, considering the poor flying done on the first day of the show, Curtiss made a fourth flight in order to make amends. This time he flew for seven minutes. His day's total was 25 minutes in the air over a distance of 25 to 30 miles.²²

Saturday, the last day of the event, brought many flights, though none of great duration. Aircraft flights were indeed "as common as raindrops. . . . They got up like Democrats in a party convention." Curtiss made two flights that totaled seven minutes in the air, and Mars and Ely each made flights of about a mile. Except for Curtiss, Willard was the most successful when he made a flight of over two minutes which was also the last of the show. Although the press continued to glorify the aviators, a somewhat jaded note had crept in after four days of flying. When Curtiss sailed around the air with such ease and security, the *Minneapolis Tribune* complained "that some folks fell to wondering why they separated themselves from their admission money to see such a commonplace stunt."

The first Minnesota air show was over, but 50,000 people had seen planes cavort through the air. For four days the weather had conspired against the aviators, prompting Curtiss' complaint that "The conditions here were the worst I have ever encountered." No matter how dangerous and difficult, Mars, Ely, and Willard had

²⁰ Here and below, see *St. Paul Pioneer Press*, June 24, 1910, p. 1. The Hudson was also called the Albany Flyer.

²¹ *St. Paul Pioneer Press*, June 25, 1910, p. 1.

²² Here and two paragraphs below, see *Minneapolis Sun-day Tribune*, June 26, 1910, p. 1, 2.

flown, and Curtiss had performed brilliantly. Arriving in Minnesota as the greatest of aviators, he left with reputation intact. He and the other flyers packed up immediately after the show and headed on to other major air meets.

IN MINNESOTA the age of flight had begun. Following the June air show was another aerial spectacular during the state fair in September, which also featured aviators of national renown. But between those two public exhibitions another ingenious Minnesota airplane took to the air.

In August, 1910, an innovative monoplane was built by St. Paul auto mechanic Fred Parker. Parker, 22, had a garage in the Hamline University area of St. Paul at 665 North Snelling Avenue. He had evidently been smitten by the desire to fly at a young age and during his teens built a series of impractical devices to get himself into the air. By early 1910 he was building biplanes and

monoplanes based on successful aircraft then flying in Europe and America. He usually crashed, however, and a sister commented that he "has broken every other bone in his body except his spine."²³

The mechanically inclined Parker seems to have been fascinated by various aircraft types that were widely known in 1910 and worked in the Hammondsport, New York, shops of Glenn Curtiss for a short time. His first practical airplane designs were biplanes patterned on those of Wright and Curtiss, but he seems to have had little success with these. Both types were relatively complex biplanes, and their control systems were not yet easy for backyard inventors to duplicate.

Indeed, Parker was concerned about the controllability of Wright and Curtiss aircraft, saying that they required an expert to handle them. "I have puzzled my head and smashed my bones over the biplane models long enough," he pronounced. "The monoplane is the thing. In Curtiss' machine his engine is so powerful that the vibration makes his aeroplane almost impossible for a man to handle. It takes a long education in aviation to fly in a Curtiss or even in a Wright machine. The biplanes are hard to turn in the air, and hard to balance."²⁴

Parker could have learned the details of several types of monoplanes with ease, for there were a number of periodicals and books specializing in aircraft. In France, Louis Blériot had been building monoplanes since 1907, and Parker knew of it. In addition to Blériot, Alberto Santos-Dumont and Henri Farman were flying monoplanes in France, and in the United States the first monoplane had been flown in upstate New York late in 1909. These flights and the details of the aircraft involved had been widely publicized.²⁵

Parker's first monoplane seems to have been closely based on the Farman. The details are not known, but the

²³Here and two paragraphs below, see *St. Paul Dispatch*, August 27, 1910, p. 1. The year 1910 saw widespread amateur activity in aviation.

²⁴*St. Paul Dispatch*, August 27, 1910, p. 1; *Minneapolis Journal*, August 27, 1910, p. 6.

²⁵Here and two paragraphs below, see Gibbs-Smith, *Aviation*, 115, 119, 122; *St. Paul Dispatch*, August 27, 1910, p. 1. Among early publications available to the general public were such periodicals as *Aero* (St. Louis) and *Aeronautics* (New York). In all likelihood, Parker used a Duthiel-Chalmers engine made by the Paris-based firm of that name. It sold several types of aeronautical engines, including a two-cylinder, 18-horsepower model weighing 56 pounds. It was an air-cooled engine having cylinders in a horizontally opposed configuration. The motor turned at 1,200 revolutions per minute and had a bore and stroke of 125 by 100 millimeters, respectively. Robert W. A. Brewer, *The Art of Aviation*, 83 (London, 1910).

THE BACKYARD creation of Fred Parker, whose shadowy figure may be discerned seated in the machine



wing on Parker's machine had a span of 23½ feet and a width of 6½ feet, the exact dimension of the Farman wing. In mid-August this machine was smashed when Parker attempted to fly it. It was probably underpowered and did not get far off the ground.

He then turned his attention to completing a second monoplane. Somewhat smaller and substantially lighter than the first, it weighed only 132 pounds; the width of the wing remained at 6½ feet, but Parker shortened the span to 20½ feet. The wing was built of six curved ribs covered with lightweight linen. The cruciform tail was also linen covered with a span of slightly over 5 feet, while the fuselage was simply an open wood framework. The engine was mounted in front and was reported to have been an 18-horsepower French engine "of the same type as the one used by Santos-Dumont."



PARKER'S FLIGHT of August 26, photographed by George Luxton; note witnesses near the center house

The 4½-foot propeller had wooden blades that appear to have been bolted into a metal sleeve slipped in turn over the crankshaft. There was probably no reduction gearing so that the engine directly turned the propeller at about 1,200 revolutions per minute (rpm). Given the lightness of Parker's aircraft, this engine and propeller combination would have supplied more than enough power to get the plane airborne.

Parker's control system was straightforward and at the same time imaginative. An aircraft in flight, it will be recalled, is capable of motion around its vertical, lateral, and longitudinal axes, motions which are respectively termed yaw, pitch, and roll: in yawing, the nose of the aircraft moves sideways; in pitch, it moves up or down; and in roll, the nose maintains direction while the aircraft rolls about an imaginary line drawn from nose to tail. These motions are normally not made independent-

ly but in a combined way. For an aircraft to fly in a safe and practical way, the aviator must be able to control the movement of his machine in all three directions in order to accomplish co-ordinated maneuvers.

Parker solved the problem of control in a simple, direct, and ingenious fashion. To provide control in pitch and yaw he built a cruciform tail unit which was attached to the framework by a universal joint. There was no fixed stabilizing area; it was, in modern parlance, an "all flying tail." Wires connected the tail surfaces to a lever at the pilot's seat, which allowed him to move the tail and thus control for pitch, yaw, or a combination thereof.

The basic idea in longitudinal control is to alter differentially the airflow over the wings and thus cause the aircraft to roll to the side with the lesser amount of lift. In 1910 the two most common mechanical methods of doing this were the Wright brothers' "wing warping," in which the wing tips were mechanically twisted, and the Curtiss system of ailerons, or the attachment to the wings of small hinged surfaces to direct air flow up or down. Parker's monoplane did not incorporate either of these mechanical systems of roll control, but another possibility did exist.

If an aircraft is sufficiently small and light, it can be made to roll by simply shifting the pilot's weight from side to side. Weight shifting is the method of control used in modern hang gliders and was used by gliding pioneers as far back as the 1890s. It is a method not so effective as the others, but in Parker's aircraft it would have been good enough to allow him to turn a circle and return to his starting point for a landing.

Parker's control system may not have been sophisticated, but clearly it was effective. It appears he attached his monoplane's high wing in such a way that it could be tilted to some degree from the directional air flow. Two push rods were linked to a lever near the pilot's seat which allowed the operator to change the wing's angle. In a slow, lightweight aircraft tilting the front edge of the wing up, thus increasing both lift and drag, allowed the machine virtually to float in for a landing. The whole idea, as Parker put it, was to gain "ease in alighting," and to make the machine "so easy to handle that the average man can fly in it." The landing gear itself consisted of two bicycle wheels up front and one in the rear.²⁶

Parker had built the airplane in his shop, which was located on an otherwise empty block bounded by Snelling and Asbury avenues on the west and east and Blair and Lafond streets on the north and south. The empty block was his flying field. On August 26, 1910, Parker made his first flight in the new monoplane. He stayed aloft for eight minutes at a height of over 100 feet, and the flight was witnessed by several residents of the area. Parker made several circuits around the field and may

²⁶*St. Paul Dispatch*, August 27, 1910, p. 1.

have covered a true distance of about four miles, if an estimate of air speed is set at about 30 miles per hour. It was clearly a flight that was controlled, sustained, powered, witnessed, and even photographed.²⁷

The St. Paul mechanic-aviator apparently took the aircraft up once more in an even longer flight but came to grief on August 30. A wheel parted company with the plane on takeoff, and the machine apparently slewed sideways shattering the propeller. Parker quickly repaired the damage and obtained a new propeller, because on September 1, he signed a contract to exhibit and, it was hoped, fly his monoplane at the fair.

MUCH of the earliest flying in Minnesota was affiliated with the state fair, which was natural and, in retrospect, inevitable. Fair officials were always on the lookout for new shows to present, and flying was the newest entertainment. It was obvious to fair promoters that exhibition flights drew crowds; selling tickets and collecting the money was an integral part of a successful fair, and the grandstand provided the necessary seating and viewing for a big event, be it a horse race, auto race, or aerial exhibition. The area in front of the grandstand was sufficiently large to pitch a tent or two to keep the flying machines out of the weather and, most important of all, the infield of the race track was adequate for taking off and landing.

In the summer of 1910 the fair board's executive secretary was the same Cosgrove who had been one of the principals in arranging for Curtiss to fly at the June air show. For the coming Minnesota State Fair, however, Cosgrove contracted with both the Curtiss and the Wright firms to supply aviators. This, it was hoped, would insure that flights would really be made, because the fair board took a less-than-charitable view of the aviators who had failed to get up during the June show. Indeed, the fair contracts required the aviators to fly in order to be paid.²⁸

By arranging for both Curtiss and Wright machines

²⁷ Here and below, see *St. Paul Pioneer Press*, August 28, 1910, p. 10; *St. Paul Daily News*, September 1, 1910, p. 1. The *Pioneer Press* reported that "many" residents witnessed the flight; the *Dispatch* and the *Minneapolis Journal* reported eight.

²⁸ *St. Paul Dispatch*, August 27, 1910, p. 2.

²⁹ Fred Charters Kelly, *The Wright Brothers: A Biography Authorized by Orville Wright*, chapter 18 (Reprint ed., New York, 1969).

³⁰ Here and two paragraphs below, see Minnesota State Agriculture Society (Fair Board), Disbursements ledger, December, 1908-September, 1910, p. 185, and Memorandum of Agreement between Parker and the State Agricultural Society, September 1, 1910, both in Fair Board Records; *Minneapolis Journal*, September 8, 1910, p. 3.

³¹ Here and below, see *Minneapolis Tribune*, September 6, 1910, p. 10; *St. Paul Dispatch*, September 6, 1910, p. 16; *St. Paul Pioneer Press*, September 7, 1910, p. 1.

to appear, Cosgrove had added the element of a contest, too. For about a year competition between the two firms had been growing. There was still camaraderie among aviators, so that the actual rivalry in the air was somewhat veiled at first. But beginning in 1909 the Wrights had filed the first of a series of lawsuits against Curtiss. They alleged that the design of the Curtiss machines infringed on patents held by them and that the Wrights were, therefore, owed royalties. The whole episode, unfortunately, became more personal and bitter as time went on, but it also tended to keep the public interested in seeing which airplanes could fly the best.²⁹

The Wrights sent pilot A. L. Welsh to the Minnesota State Fair with one of their machines, while the Curtiss aircraft was handled by J. C. Mars. This was the same "Bud" Mars who had accomplished only a couple of short flights in June, and he aimed to redeem his reputation in Minnesota now. Bringing these flyers to the public was not an inexpensive proposition. Fair board records show that after the exhibition, Mars received two checks totaling \$2,500 and the Wright company a check for \$2,400.³⁰

To add an element of local interest, Fred Parker agreed to exhibit and fly his monoplane. While it is not known who approached whom, Parker's flights in late August were reported by the *Minneapolis* and *St. Paul* newspapers, and fair officials certainly would have been aware of this local aviator. In any event, Parker exhibited his machine in a tent, the location of which and any admission charge were to be determined by the fair board. Parker also agreed to make one flight each day of the fair between 5 and 6 P.M., and he would have one try only unless fair officials elected to give him more. He was to fly from in front of the grandstand, taking off from and circling the one-mile race track at an average altitude of at least 40 feet.

It appeared, however, that Parker never got off the ground. He was to collect \$75 a day for each day he flew, but there was no mention in the fair's financial records that he was ever paid. The daily press was also silent about flights by Parker. This Minnesota home-grown aviator was, unfortunately, not able to make a public reputation before the crowds of the state fair. Like many amateur airplane builders of the period, Parker faded into aviation obscurity.

DURING the course of the 1910 fair, which lasted from Labor Day, September 5, through Saturday, the National Conservation Congress was meeting in St. Paul. Many political dignitaries were in town and, of course, could not resist a speech to a crowd. And so it was on Monday that fairgoers were treated to speeches by Governor Adolf O. Eberhart, Senator Knute Nelson, and finally President William H. Taft. On Tuesday an appearance by Teddy Roosevelt held the crowd's attention. It was a good thing. Those who came to see flying saw a fizzle.³¹

On Monday Bud Mars made a short flight in a Curtiss biplane around the infield in front of the grandstand but went no higher than 60 feet. In attempting to demonstrate a Wright biplane in flight, A. L. Welsh got off all right, but wind, reported by the Weather Bureau as gusting to 24 miles an hour, flipped him and nosed the craft into the ground from a height of about 50 feet. Welsh's left ankle was badly cut by a bracing wire, and it was remarkable that he was not hurt more severely. After treatment at a hospital, Welsh, who had attended the Wright brothers' first flight school, retired to quarters at the Dyckman Hotel in Minneapolis, his flying finished for the duration of the fair. His aircraft was so damaged that it could not be repaired, despite the fact that the Wright people had brought a large supply of spare parts with them.

This turn of events obviously put the Wright contract in jeopardy. On receiving Welsh's explanatory telegram, the Wright firm acted with alacrity and immediately shipped a new aircraft from Dayton, Ohio. The company ordered a change of itinerary for its star pilot, Arch Hoxsey, sending him to Minnesota as a replacement for the injured Welsh.³²

In a career as short as it was spectacular, Hoxsey had become one of the best-known aviators in the country. A native of Illinois, he saw his first plane at the Los Angeles air meet and resolved to fly. Along with Welsh, Hoxsey joined the Wrights' training program for pilots at Montgomery, Alabama. In May, 1910, he and Walter Brookins, an associate of the Wrights from Dayton, made several ascents by moonlight — probably the first night flying in history. In June Hoxsey began exhibition flying; for the next six months he flew in cities and towns from New Jersey to California and established a reputation as a daredevil. His skill won him the sobriquet "King of the Air" and induced former president Theodore Roosevelt to try his first plane ride.

Just two days before he arrived in St. Paul, Hoxsey had had a mishap at the Nebraska State Fair in Lincoln. While taking off from the infield of a small race track surrounded by barns, tall trees, and a grandstand, he collided with the side of a barn. His aircraft was wrecked, but there was a new one awaiting him in the Twin Cities. When he arrived in Minnesota, a Minneapolis newspaper reported that he "looks today as if he were suffering from a combination toothache and the after results of fighting a hornet's nest. His left cheek is puffed and his left eye is closed; he limps [and] wobbles."³³

In St. Paul state fair skies stayed clear, but early September winds continued to plague the exhibition flights. On Tuesday Mars got in one brief hop but had engine trouble; on Wednesday wind gusts of 35 miles per hour were recorded, and both Mars and Parker kept their fragile machines on the ground; and Thursday

brought more of the same. Mars needed only a break in the winds, and the new Wright airplane had arrived from Dayton. At last on Friday the bedeviling wind abated, and in the light breezes of late afternoon both Hoxsey and Mars made splendid flights. Perhaps 10,000 people had jammed the grandstand finally to see some flying, and they were rewarded with a "first in Minnesota" when they witnessed "two modern airships in action," a Curtiss and a Wright in the air at the same time.³⁴

Hoxsey, after coaxing a balky engine to life, took off from the race track and circled the fairgrounds in a picture-perfect flight. He attempted no stunts but kept the aircraft under absolute control, went up nearly 1,200 feet, and landed an impressive 21 minutes later.

When Hoxsey had been aloft for five minutes, Mars cranked up his more powerful 8-cylinder Curtiss. His flight was shorter than Hoxsey's, and he went no higher than 300 feet, but he did a series of crowd-pleasing, low-altitude dives and glides. He landed, slightly damaging his machine, and a few minutes later Hoxsey set down next to him.

Everybody loved it. The crowd, waving hats, handkerchiefs, and canes, cheered themselves hoarse. Joseph M. Underwood, president of the fair board, ebulliently shook the pilots' hands, saying, "Boys, those were bully flights." The *St. Paul Pioneer Press* sniffed that the flying at the June air show had been "mere child play in comparison," and then rhapsodized about Mars, saying that "whenever the nervy aviator went by the grand stand he appeared to be riding on a billow of air that would put the pink blush of shame on a deep blue wave of the sea."³⁵

Comparing the performance of the two machines was an irresistible temptation. Clearly, the Wright aircraft had flown longer and gone much higher, but the Curtiss was thought to be better behaved. The *Minneapolis Journal* of September 10 judged that Mars' aircraft "did not look as stable and durable as did that of Hoxsey's, appearing in comparison more like a little bird. It moved faster and turned quicker than did that of the Wright make."

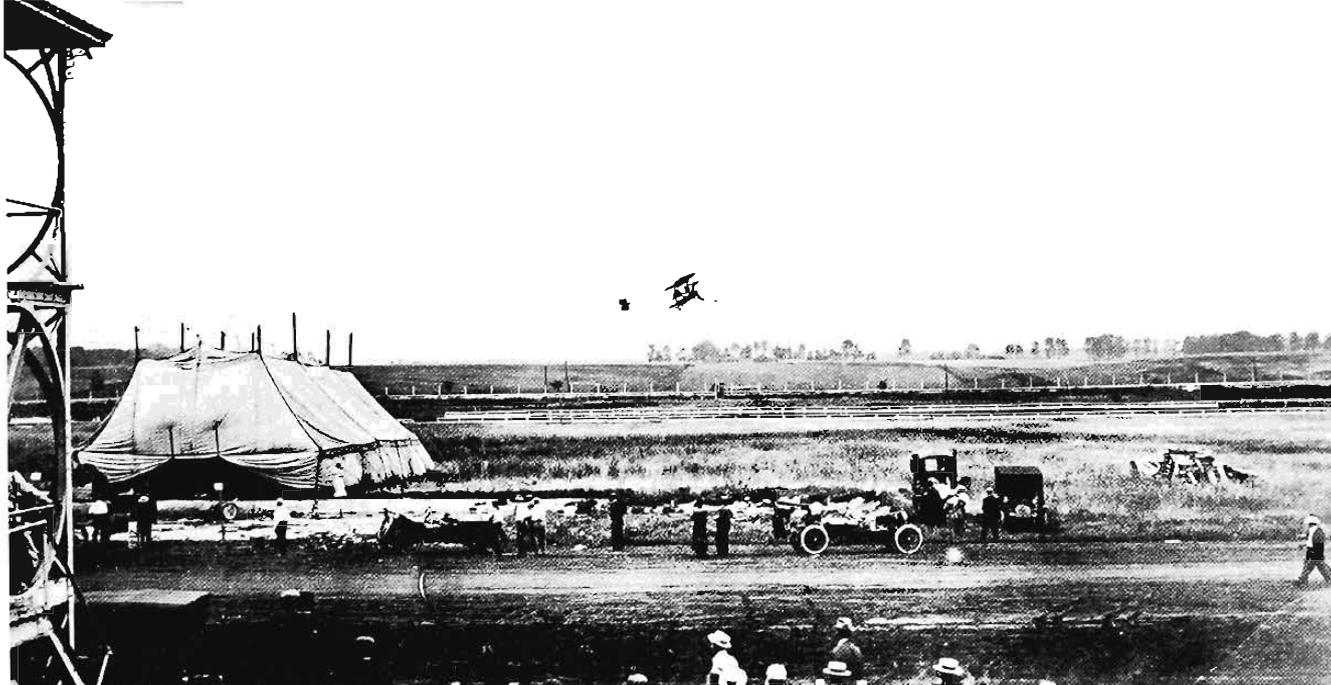
ON SATURDAY afternoon, the final day of the 1910 fair, both aviators flew once more. Although it was a clear day in the low 70's, the wind was a nuisance again, coming from the southwest at 9 miles an hour but with sharp gusts of up to 25. Hoxsey's first attempt, at 5 P.M., saw him unable to lift off, but Mars did make it. He circled

³²On Hoxsey, here and below, see Morchouse, "Flying Pioneers."

³³*Minneapolis Journal*, September 8, 1910, p. 3.

³⁴Here and below, see *Minneapolis Journal*, September 10, 1910, p. 14.

³⁵*St. Paul Pioneer Press*, September 10, 1910, p. 7.



PILOT BUD MARS, circling the fairgrounds in a Curtiss-built biplane in September, 1910

the one-mile race track in a flight of about three minutes. By then the two big propellers of Hoxsey's Wright were turning again; this time he got off into the sharp wind. Flying to the west end of the fairgrounds, he turned back to the east doing a few circles and figure eights along the way. Over Machinery Hill he hung nearly motionless in the air for almost five minutes and landed after a flight of 16 minutes.³⁶

Although the first four days of the fair had been disappointing, Mars and Hoxsey had thrilled the public on the last two days. Both of these "men-birds" had held the crowd spellbound. What seemed most impressive was the control they kept over their machines even as

³⁶ Here and below, see *Minneapolis Sunday Journal*, September 11, 1910, sec. 1, p. 8; *St. Paul Pioneer Press*, September 10, 1910, p. 7. A plane's ground speed is its air speed coupled with any wind factor. If, for example, the craft flies at 35 mph and the wind is 20 mph, the ground speed would be 15 mph into the wind or 55 mph with it. Hoxsey's ground speed was obviously so low that he appeared nearly motionless.

³⁷ Morehouse, "Flying Pioneers."

THE PICTURES on p. 46, 48, 55, and 56 are from *Minneapolis Journal*, June 19, 1910, August 8, 1907, August 28, 1910; on p. 49, from *Jane's All the World's Airships*, 266 (London, 1909); on p. 51, from *St. Paul Dispatch*, June 25, 1910; on p. 52, *St. Paul Pioneer Press*, June 26, 1910. The photograph on p. 49 (lower right) is used with permission of William Wilcox and that on p. 53 by courtesy of the United States Air Force Museum, Wright Patterson Base, Ohio. All others are in the MHS audio-visual library.

they had to defy the wind in flight. Their flying was described as having the "ease and grace of a bird," and the "operators handled their machines with such ability that they were able to fly at will over any of the aerial courses, despite the fact that the wind was rough and choppy at intervals."

The two pilots, of course, did not linger to enjoy their new-found Minnesota fame. There were contracts to be fulfilled in other places. Mars crated his Curtiss and headed for Rock Island, Illinois, where he began a five-day fair date on Monday, September 12. Hoxsey's next date was in Milwaukee at the Wisconsin State Fair, where he performed well until the last day when his aircraft swerved on landing and ran into the crowd, hurting eight people. Hoxsey escaped injury, but in late December, flying at an air meet in Los Angeles, where, ironically, it had all started for him, a strong wind gust snapped major spars on his machine and he plummeted 600 feet to instant death. He was 26 years old, and his calling as an aviator had lasted from January to December, 1910.³⁷

There would be more flying to thrill Minnesota crowds at future state fairs, and numerous home-grown machines and their self-taught builders and pilots would soon appear. Wilcox, Rost, Johnson, and Parker had pointed the way for future amateur inventors. It had, however, been some of the most illustrious names in early aviation that had riveted public interest on the new art of aviating. After the feats of Curtiss, Ely, Hoxsey and the rest, neither entertainment nor transportation in Minnesota would ever be quite the same.



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