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Peter Riedel's 1937
Glider View of Manhattan
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The First Glidermen Over Manhattan

Jack O'Meara, February 12, 1931

"Jack O'Meara cuts loose from towing plane above Manhattan end of Queensboro Bridge," the February 13, 1931 NEW YORK TIMES headlined. The previous day O'Meara had fulfilled one of international glidermen's quests: being the first to soar over Gotham's canyons.

It wasn't easy. Special permission for the experiment had to be obtained from The Department of Commerce, The New York Department of Parks, and New York Police Department,

with the provision that "the fliers cling closely to the river." (1) Bureaucratic functionaries satisfied, February 12, O'Meara towed-off under an overcast sky from Glenn Curtiss Airport (North Beach, Long Island, now La Guardia). His Franklin Utility Glider was hooked to 500 feet of steel cable behind a Whirlwind engine-powered, Challenger biplane piloted by Okey Bevins. (2)



J.K. (Jack) O'Meara

headed down the East River into a west-southwest wind towards Manhattan. They weren't alone. As O'Meara later wrote, "We made turns to the left and right, with the newsreel ship maneuvering all around us and with the New York City Air Police ships who were escorting us flying off to one side." (3)

He encountered choppy air over the Queensboro Bridge and Bevins aimed the towplane on a line that would take them between the monolithic Empire State and Chrysler skyscrapers.

He released over Broadway and 40th Street at 3,800 feet and slowed the Franklin to a leisurely 25 mph. "For fifteen minutes I flew around at will," he said, "making figure eights...sometimes looking down into Times Square, then over the river and now straight down into Central Park, a bird's-eye view of the greatest city in the world."

The previous year, John K. (Jack) O'Meara, a test pilot for the Akron, Ohio, Baker-McMillen Company, made an unofficial American duration record flight of one hour and thirty-five minutes, ridge soaring off Elmira, New York's South Mountain. This demonstration of the soaring potential of the ridges surrounding the city was instrumental in the National Glider Association's decision to hold the First National Glider Contest there in September, 1930. He was national soaring champion in 1932, and attended the international meet at the German Wasserkuppe in 1931. He held the 13th Federation Aeronautique Internationale "C" Certificate, and was the first American to qualify for the FAI Silver "C" award. (4)

Finding himself down to 3,000 feet over Manhattan, O'Meara sprinted back to the vicinity of the Queensboro Bridge where he first encountered turbulent air on tow. Scratching along in tight spirals he coaxed the Franklin Utility into weak but steadily rising air. He explained that he found no lift over Manhattan because the southwestern wind was bending the rising warmer air generated by its chimneys and apartment buildings, and moving it in a northeasterly direction.

Then, centering on an especially strong slanted thermal O'Meara gained altitude rapidly, to the amazement of the his maneuvering escorts. He topped-out at 4,000 feet, higher than at any time on tow. Nosing the ship around toward the East River, he proceeded along Welfare Island for Bowery Bay and the field. Unfortunately, a thin veil of smoke and haze completely obscured the flight from the eyes of those on the streets of Manhattan.

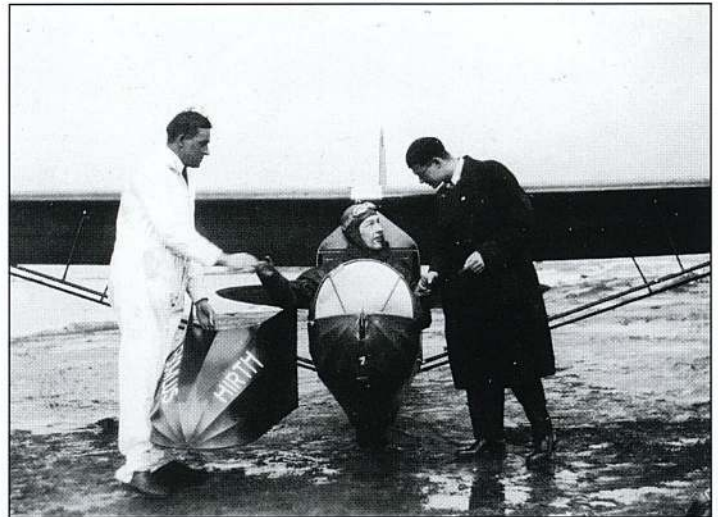
O'Meara was still at 1,500 feet over his Glenn Curtiss Airport launch-site where a crowd of 500 had gathered to watch the landing, including pioneering glider-builder and pilot William Hawley Bowlus. O'Meara had arrived with enough altitude to "spiral and cut a few capers for the benefit of the spectators," he later said.

He executed a perfect landing on the ice and water-covered field, one hour from takeoff.

"It was great sport," O'Meara told Bowlus. "When I started to climb I realized that I was getting into a combination of upcurrents produced by the buildings and the thermal currents from the city." (5)

"A Striking Glider Stunt," opined the NEW YORK TIMES editorial page on the 14th, "Before it will be safe to cruise above the skyscrapers, if it ever is in a motorless machine, there should be experimenting with kites and balloons to register the direction and force of the cross-currents."

In a subsequent article O'Meara wrote that he "had succeeded in proving that there was a sufficient amount of heated air rising from the metropolitan area to support a glider in flight." (6)

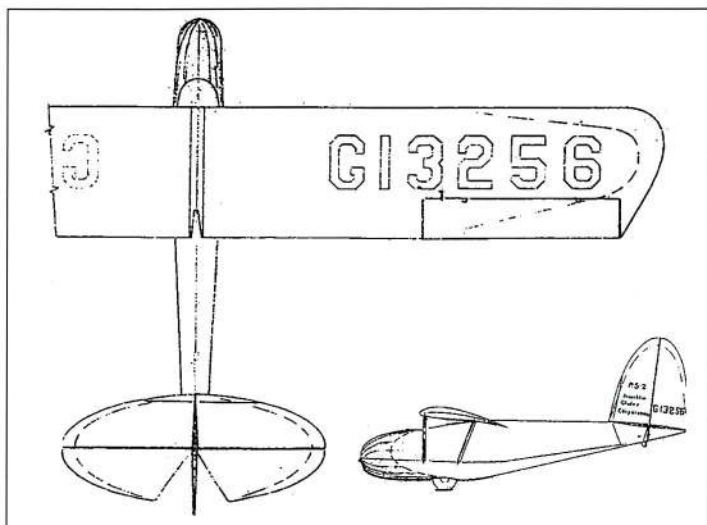


Jack O'Meara in the Franklin PS-2 with William Hawley Bowlus, left and Wolf Hirth, right at Glenn Curtiss Field, (now LaGuardia) Long Island.

In the early 1930's, O'Meara had one of the first high-performance sailplanes owned by an American pilot, the famous "Chanute." It was originally known as the "Darmstadt I." He had purchased it from a group of German pilots after it had been wrecked at Cape Cod and had restored and renamed it. On June 28, 1934, with Richard C. duPont, Warren E. Eaton and Lt. Com. Russell Holderman, O'Meara participated in the first airplane quadruple glider tow. O'Meara was also one of the pilots in the International Sky Train which flew from Miami, Florida to Havana, Cuba in the mid-thirties. In 1941 he was associated with Hawley Bowlus on the West Coast in the development of a troop-carrying glider.

O'Meara was killed that year in a crash, testing a basic trainer monoplane for the Harlow Aircraft Company, of Alhambra, California. (7)

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A Felix Chardon drawing of the Franklin PS-2.

The Next Gliderman Over Manhattan, Wolf Hirth

The month following O'Meara's New York flight, the internationally famous German glider pilot and builder, Wolf Hirth repeated the feat in his Musterle sailplane. After two months of weaving through the same bureaucratic maze that had confronted O'Meara, the popular Wasserkuppe veteran obtained permission. He gave last-minute assurances that he would, "not fly above high buildings until I at least reached 1,000 feet." (8)

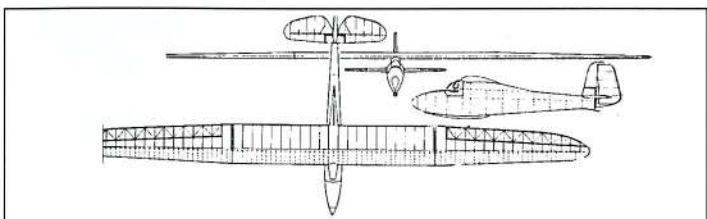
This time however, the launch was to be out over the Hudson River, from Riverside Drive at 161st street. (9)

"The tail of my plane was anchored to a truck standing on the Drive; twenty men had hold of the double launching shock cord," he said. "Their running space was quite limited. Only about 90 to 100 feet separated them from the steep descent of 70 to 90 feet down to the river." Then, with the launch crew racing toward the river's edge, and a low swoosh," Hirth was off.

Ten seconds later, Hirth in his open cockpit, Musterle was at 100 feet in strong ridge lift. Following his first turn 30 seconds later, his altimeter read 200 feet. At 600 feet he headed down to 150th Street, then back up to 172nd Street, "the furthest I was allowed, keeping my promise to the police," he later mused. "Too bad, as it would not have been difficult to fly all the way down to the Battery." At almost 750 feet mid-river, Hirth said that he was tempted to head to Jersey. Forty minutes into the flight, he noticed three men waving red flags. "The meaning was obvious, the order to land." He had planned to soar for two hours.



Wolf Hirth with Musterle. Below, a three-view based on the Musterle drawing in Martin Simons, VINTAGE SAILPLANES 1908-1945.



It was almost five o'clock and the police wanted to reopen Riverside Drive to rush-hour traffic. The landing was difficult. He later wrote, "Calling on all my experience gathered in hundreds of flights and with the help of Madame Luck I made it. After a short slide, my plane stopped almost near the end of the landing space."

Thousands of otherwise blasé urbanites massed on the Drive watching the flight, then welcoming the successful flyer. "The Police Department showed happy faces, for nothing happened," the bespectacled airman wrote. "This flight, and everything connected with it will always be one of my dearest memories." (10)

Peter Riedel's 1937 New York Layover...Over The City, That Is

He started from Bogota, Columbia, Commercial airlining across two continents. Peter Riedel was en route to the 1937, Eighth Annual National Soaring Contest in Elmira, New York. Though a German national, he had been invited to participate as a foreign guest. (11)

Arriving at Newark, he planned to spend a few days in New York. Through prior arrangement with Lufthansa friends, Riedel's elegant Senior-Sperber sailplane with the 17 meter (55 feet, 9 inch) wingspan, had preceded him by boat.

It was waiting for him at Roosevelt Field. The plan was to trailer it to the Elmira contest.

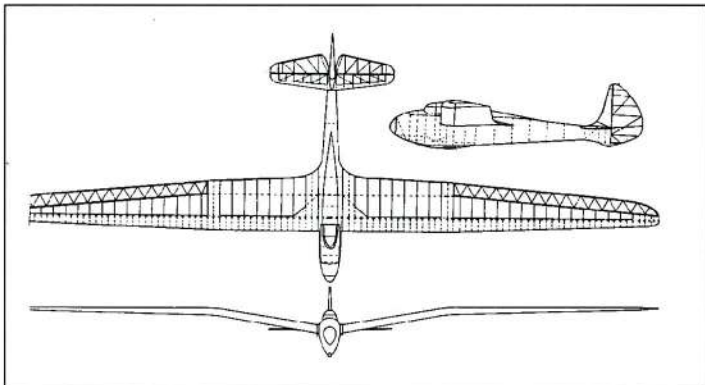
Riedel was then under contract to fly Ford Trimotors (the famous Tin Goose) for SCADTA Airlines over the jungles of Colombia, South America. He was the youngest competitor to fly at the 1920, Wasserkuppe contest in his home-built PR I biplane glider.

Previously, he had sailplaned over many of the major European cities and won several prestigious awards. He was on Professor Walter Georgii's 1934 South American soaring expedition with the German "greats" of his day: Wolf Hirth, Hanna Reitsch and Heini Dittmar.

What a challenge the gleaming towers of Manhattan must have presented to Riedel. In his memoirs he mentions that such a flight was planned. However, aside from assistance from Eddie Rickenbacker, to whom he was introduced by the renowned WW I German ace, Ernst Udet, no mention was given of official permission for such a flight.



Peter Riedel preparing for a launch at the 1937, Eight Annual National Sailplane Contest at Elmira. (NSM Archives). Below, a modified drawing of Riedel's Super Sperber based then a more detailed three-view in Martin Simons', "Vintage Sailplanes 1908-1945."



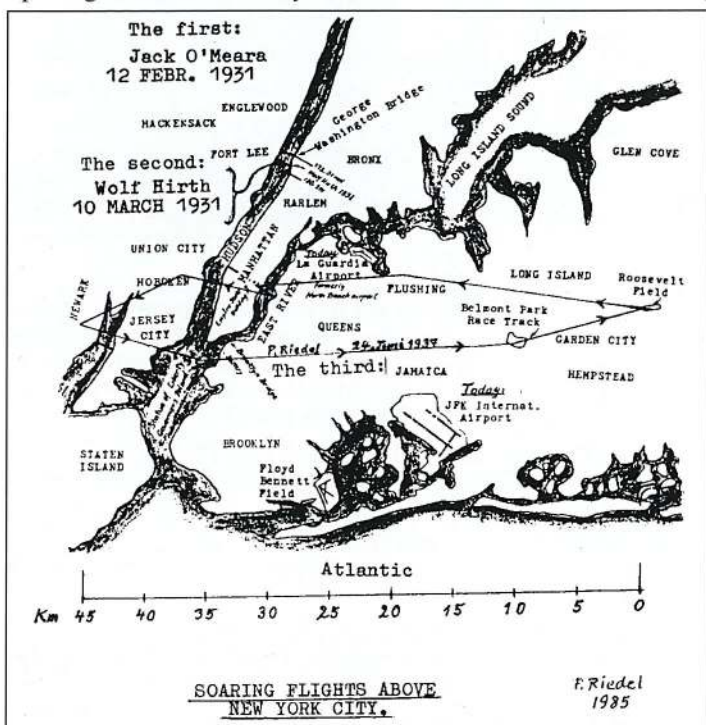
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At Roosevelt Field, Riedel's friends lined up a 225 hp Stearman for the tow. In his words, "In seconds the Super Sperber was airborne. One big thermal bounced him (the towplane) higher, then hit me seconds later. Then another even stronger than the first. A glance at the altimeter, 300 meters-enough. 'Pang' went the tow cable. That was the shortest tow of my life."

He was 3,000 feet over Roosevelt Raceway, and could see Manhattan 23 miles away. Passing over Hempstead and Belmont Park Raceway, Riedel was trying to maintain a course that would position him near landable sites should he run out of lift. After all, as he later wrote, "Taking part in the Elmira Contest was the main purpose of my being here, not this stunt of flying over Manhattan's skyscrapers."

Now he could see the Empire State Building six miles away. He headed for it; there was always Central Park in an emergency. After a brief spell of dizziness ("for the first time in my life, sitting at the controls of an airplane") Riedel adjusted his Leica for picture taking. Circling directly over midtown spires, he said, "Anybody could take such pictures from any (power) airplane; so I had to make sure that the gull wing of my glider was in the picture."

By now he was down to 2,200 feet. "If I missed the approach to Governor's Island, I would be floating in the Upper Bay" he wrote. Spotting some tall chimneys on the other side of the East River,



Track of Riedel's 1938 flight over Manhattan.

Riedel over flew the Brooklyn Bridge. The ascending thermal energy from these plants saved the flight and bumped the Senior Sperber back up to 5,000 feet.

Heading back over Manhattan, he hopped across the Hudson. "Union City, Hoboken, Jersey City, Newark, one after another slid underneath my wings. The thermals were powerful and it was easy to stay up," he wrote.

The hours passed as he slowly reversed his track returning to Roosevelt Field. "There I spent my altitude with some loops and Immelmann-turns; then landed shortly before 6 p.m." Riedel had thermaled, circled and photographed his way through two states around the New York metropolitan area for almost eight hours. "It was an unforgettable experience," he wrote. (12)

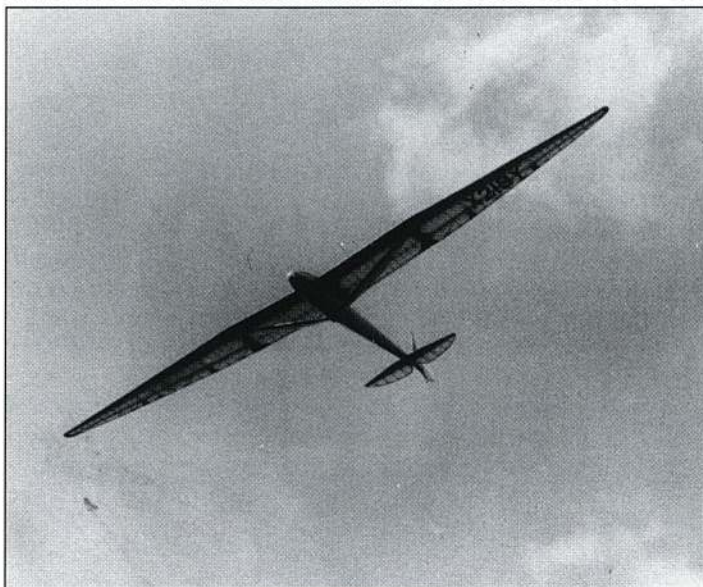
A few days later he arrived in Elmira for the 1937 Nationals. Paul A. Schweizer, in his book, WINGS LIKE EAGLES (13) said, "Riedel's sailplane from Germany attracted much attention because

of the swastika on its tail, a required element of German certification. Riedel finished far ahead, demonstrating the superiority of a tight spiralling technique over the shallow turns of the other competitors." Being a foreign national however, he could not be named champion. Richard duPont, flying his new Minimoa (which is now on display at NSM) was declared 1937 winner. At the 1938, 9th Nationals Riedel flew 196 miles from Elmira across New York City to Roosevelt Field.

Warren Merboth, Elmira to New York in 1939

Two years later, at the 10th Annual National Soaring Contest in Elmira, a Glen Rock, New Jersey gliderman, Warren Merboth, of the North Jersey Soaring Association piloted Richard duPont's 1933 Bowlus duPont Albatross, 202 miles, across the metropolitan area to Roosevelt Field, Long Island. (14) This flight was especially notable in that the Albatross was six years older and considerably slower than ships that Merboth was flying against in competition.

Writing in the August 1939 SOARING magazine, Arthur Lawrence called the 10th Nationals, "The Best One Yet." The



Warren Merboth's Bowlus duPont Albatross over Harris Hill at the 10th Nationals. (NSM Archives)

American altitude record was exceeded seven times with Bob Stanley in his home-built "Nomad" finally topping out at 17,264 feet. The record for distance was stretched to 233 miles by Chester Decker's flight to Atlantic City NJ, in the Minimoa. In separate flights, Lewin Barringer trundled off 101 miles and 6,560 feet for national two-place distance and altitude records in the Airhoppers' Schweizer 2-8.

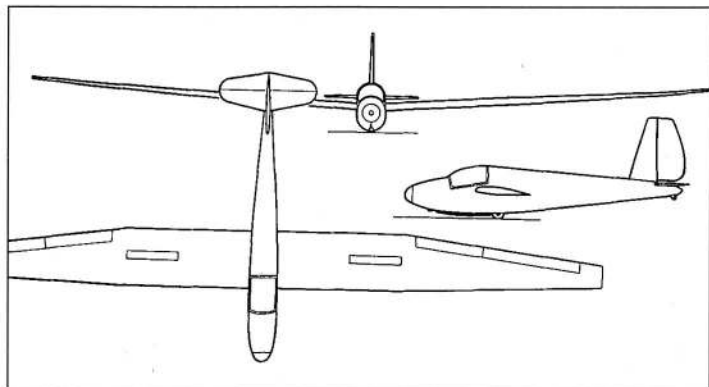
Both the Bowus duPont Albatross and the Minimoa are in the National Soaring Museum's collection and on display in the main hall.

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Joe Funk, left (unidentified, center) and Warren Merboth at the 1939 Nationals. (NSM Archives)

Post WWII, Paul A. Schweizer, was flying his 1-23D in the July 7-16, 1953, 20th Nationals. He aimed for the home base of one of the Schweizer Aircraft Corporation's customers, Grumann Aircraft Engineering Corporation, at Beth Page, Long Island. (15) The 203-mile hop extended down across the Allegheny Mountains, the New York -New Jersey border, and traversed the New York City metropolitan area. He was followed as far as Idlewild (then Called New York International) by Stan Smith in a Schweizer 1-21, Britain's Cmdr. Nick Goodhart in a surplus Laister-Kauffman 10A, and Steve Bennis in his group's Schweizer 1-23D. Idlewild tower operators were profoundly displeased at what officials termed "tiny gliders" and "toys" interrupting the traffic patterns of overseas flights and landing on the ramp. The soaring competition's fascination with Idlewild was due to National Airlines' offer of \$200 and \$100 prizes for the first and second sailplanes to land at the farthest National terminal from Elmira.



Schweizer SGS 1-23D. (NSM Archives)

Such New York flights of fancy are in the distant past. However, the trailblazing airmanship of these pilots and the aerodynamic capabilities of their ships are an important segment of America's soaring heritage.

Peter Riedel, Last Of The Famous 1920 German Wasserkuppe Glidermen

The world soaring community recently lost one of the last of its aviation frontiersmen, Peter Riedel.

He was a youthful Wasserkuppe competitor, championship and world-record-holding sailplane pilot, instructor, airline pilot, aero-explorer, pre-war German Air Attache, writer and adventurer.

The 93-year-old dean of motorless flight, Peter Riedel, of Ardmore, OK, who became a United States citizen in 1959, died on Nov. 8, 1998.

He showed an early fascination with flight. As a 14-year-old, the fledgling airman wobbled and porpoised tentatively airward in a hang glider of his own design. Then, he became the youngest competitor in the 1920 Wasserkuppe glider meet, which was organized by German magazine publisher, Oskar Ursinus.

Riedel's second design, the "PR-II", was a home-built biplane glider that was launched like a kite. It had a seat, landing gear and full control. In the contest, he won a \$10 prize, a significant amount during Germany's postWW I war inflationary spiral.

Riedel was born on August 25, 1905 at Dehlitz, near Weibenfels, Germany. By 1925, he learned power flying at the Sportflug GmbH Magdeburg. For the next seven years his time was spent scurrying between engineering and construction courses at the Darmstadt Technical High School and the flight department of the Rhoen-Rositten-Gesellschaft, where he eventually became chief flight instructor.

1. "How It Feels To Glide And Soar Over New York City," NATIONAL GLIDER AND AIRPLANE NEWS

April, 1931

2. NEW YORK TIMES, FEBRUARY 13, 1931

3. Ibid. 1

4. ELMIRA STAR-GAZETTE, NOVEMBER 20, 1941

5 and 6. Ibid. 1

7. Ibid. 4

8. "My Soaring Flight In New York City," NATIONAL GLIDER AND AIRPLANE NEWS, May, 1931

9. NEW YORK TIMES, April 5, 1931

10. Ibid. 8

11. SOARING, May, 1977

12. Ibid. 11

13. WINGS LIKE EAGLES, Paul A. Schweizer, pg. 54

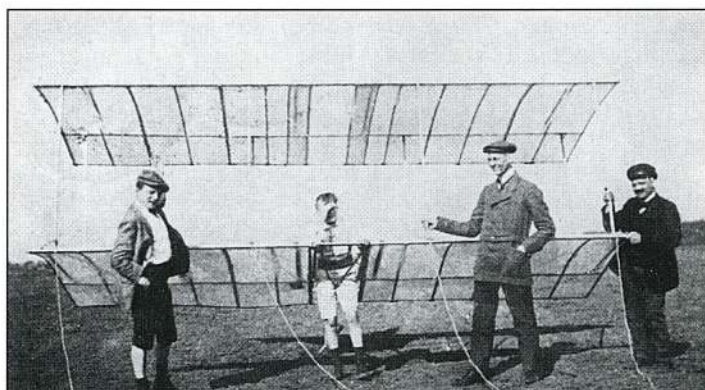
14. SOARING, August, 1939, "The Best One Yet," by Arthur awerence

15. SOARING, September-October, 1953

ON THE COVER

The Chrysler Building at 2,500 feet, from Peter Riedel's 1937 sailplane flight over Manhattan. He wrote, "I looked down and there they were, the Chrysler and the Empire State Buildings reaching up above the others. I fumbled for my Leica and prepared it for some shots. Anybody could take pictures from any airplane; so I had to make sure that the gull wing of my glider was in the picture. What a sight! I have soared over Berlin, Rio de Janeiro, Sao Paulo and Buenos Aires, but this was unsurpassed.

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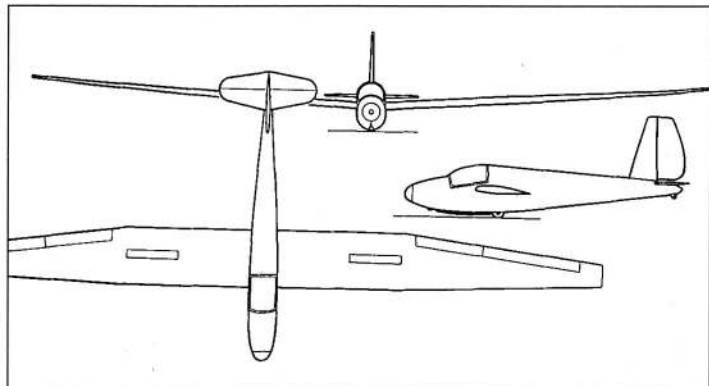


14-year-old Peter Riedel and his home-built PR-I glider at the 1920 German Wasserkuppe meet. (SOARING, January, 1966)

Along with Gunther Groenhoff, Riedel pioneered airplane tows with standard sailplanes of that period: "Fafnir" (Groenhoff), "Darmstadt" (Otto Fuchs), and "Starkenburg" (Stark). Riedel earned the world's seventh Silver "C" in 1932, and set a world distance record the following year. That year he also won the Hindenburg Cup for being the year's best German soaring pilot.

Continued on page 6

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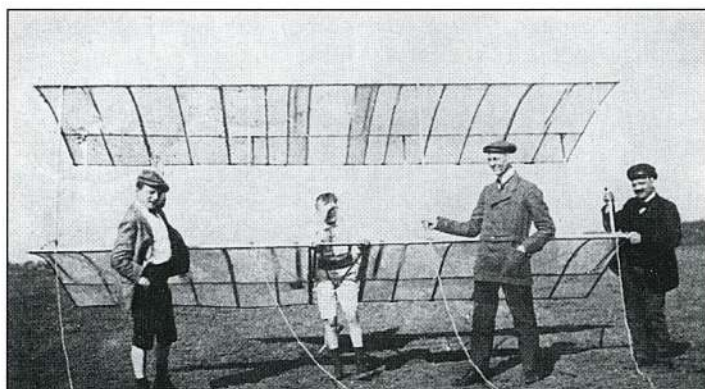
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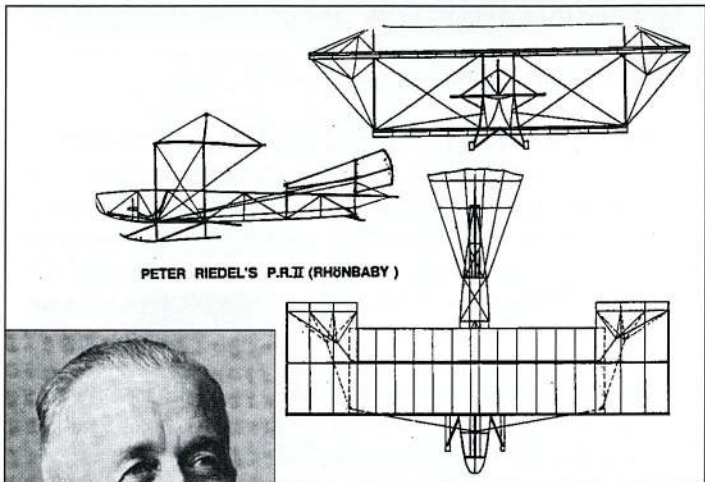
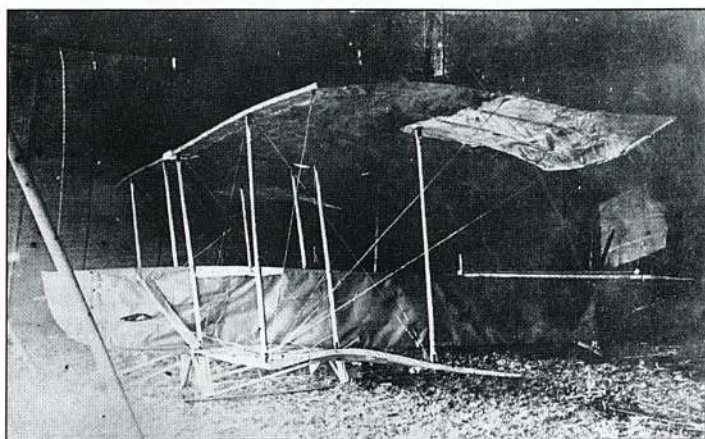
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Top - Riedel's second design, the PR-II (SOARING, January, 1966). Center - PR-II three-view from NSM Archives. Left - Peter Riedel, 1966 (SOARING January, 1966)

In 1934, he took part in Professor Walter Georgii's South American Soaring Expedition along with Wolf Hirth, Heini Dittmar, and Hanna Reitsch. During the trip he made headlines with this spectacular soaring flights over Rio de Janeiro, Sao Paulo and Buenos Aires. The same year he was a member of the famous German soaring team in the first Swiss Alpine Soaring Contest at the Jungfrauoch-Glacier. Included were Germany's third ranking WWI ace Ernst Udet, Heini Dittmar and Ludwig Hoffman. Riedel placed second.

During the years 1934 to '36, Riedel flew for Lufthansa. Then he piloted trimotors over the mountainous and sometimes uncharted jungles of South America for SCADTA, the Columbian Airline.

While demonstrating soaring to the Swedes in 1936, he inadvertently made one of the most profitable glider flights of the decade. He released over Malmo, Sweden, and headed seaward across the Baltic, making one of the first over-water sailplane flights. Landing at Copenhagen, he was notified that he had just won a prize of 1,000 Danish crowns.

Following that, he was appointed to the staff of the German Embassy in Washington as Assistant Air Attache, thanks to the influence of his old soaring partner, Udet. Whatever else his duties proscribed, Riedel always made time for breaking sailplane records in the U.S.

His first notable outing before leaving for the 1937 Elmira NY, U.S. Nationals, was a spectacular flight over New York City. He scored the most overall points in the subsequent contest, but as a German national, could not be named winner. The same happened

in the 1938 contest. On both occasions he was awarded the Bendix and duPont Trophies.

In 1939 Riedel towed off in a "Kranich" near Los Angeles, CA on one of his boldest projects: a series of soaring hops across the United States, LA to NY. He made the first glider crossing of the Continental Divide, from Winslow, AZ to Magdalena, NM. His longest flight was 245 miles from Albuquerque, NM to Hereford, TX, during which he coaxed his ship to an altitude of 18,000 feet. He abandoned his flight plan because of insufficient time.

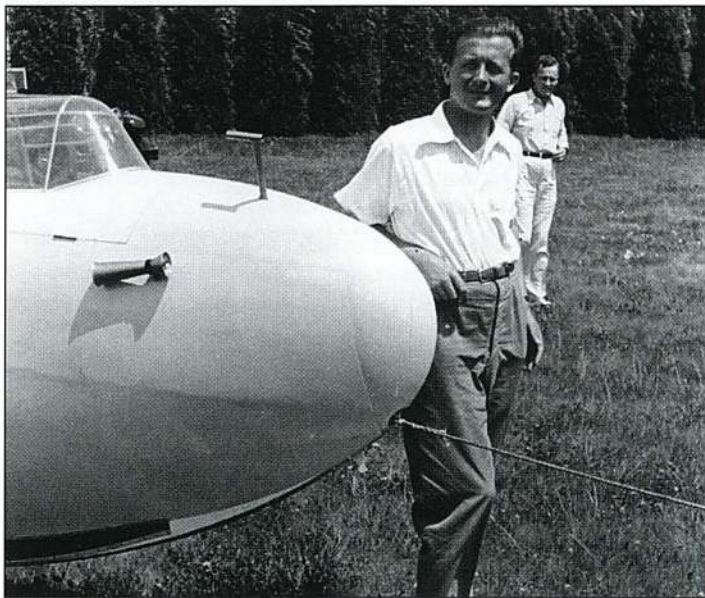
Riedel was returned to Germany in 1942, as part of a diplomatic exchange: ours for theirs. He spent the war years in Stockholm, Sweden as an Air Attache at the German Embassy. After a sharp disagreement with actions of the Nazi regime, he sought asylum there in 1944. He was permitted to stay until 1946, working as an auto mechanic.

The odyssey that followed read like a movie scenario. At the war's end Sweden returned all Germans to their homeland. Riedel went underground, emerging only to leave in a sailboat with Estonian and Latvian refugees. He made it as far as Casablanca, Morocco, where the French authorities took him into custody for traveling on a forged passport, and for a background investigation. Virtually smuggled out, he managed to sign on as a crewman aboard a 40-foot British yawl bound for Venezuela. There, he worked as a civil engineer. Next, the multi-talented gliderman turned up in South Africa, then Canada, working at similar jobs before finally returning to the United States in 1956.

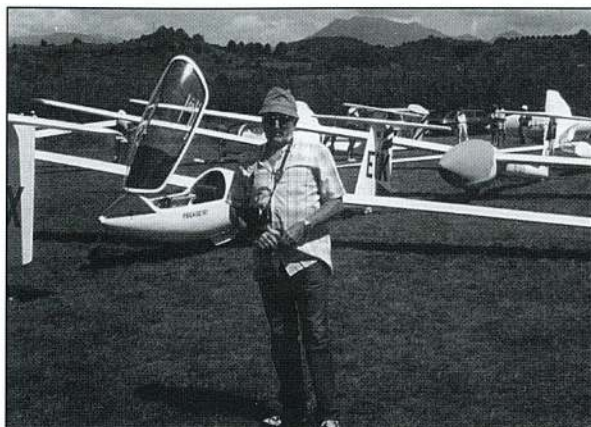
Riedel quickly put his aviation expertise to work in engineering management with TWA in Seattle, WA. In 1960 he shifted to Pan American World Airways at their overhaul base in Miami, FL, as a staff engineer. A transfer to Karachi, Pakistan, as Pan Am technical manager sent him to Cam Ranh Bay, Viet Nam, where Pan Am has a U.S. government maintenance agreement.

In 1968 Riedel went to work with an old soaring buddy in Denver, CO. In 1969 he was in Ardmore, OK, as technical manager for Jet Aero Services. In 1970, he retired to finish his three-volume history of soaring, published under the comprehensive title, *ERLEBTE RHOENGESCHICHTE*, (*EXPERIENCED RHOEN HISTORY*) 1911-1939.

Now, all the great names of the Rhoe are gone: Hirth, Kronfeld, Klemperer, Groenhoff, Fokker, Martins and finally, Riedel. Auf Wiedersehen.



Riedel with the Kranich at duPont Airport, Wilmington, DE, in 1938. He wrote, "In the background, Lt. Col. Olds of the first U.S.A.F. squadron equipped with the XB-17, the new four-engine Boeing Flying Fortress." (NSM Archives)



Cedric Vernon and Frank Irving Deliver NSM's 26th Annual Ralph S. Barnaby Lecture

This year, two overseas delegates to the September 10-12th, OSTIV-SDP (Organisation Scientifique et Internationale du Vol a'Voile, Sailplane Development Panel) meeting held at the National Soaring Museum delivered the 26th Ralph S. Barnaby Lecture. Cedric Vernon, Guildford, England delivered a technically oriented talk, "Some Test Flying Experiences", and Francis G. Irving, Imperial College, England, spoke on, "The Imperial College Gliding Club."

These lectures, sponsored by the NSM and named in honor of Capt. Ralph S. Barnaby, USN, are given annually by outstanding personalities in soaring. They recall historical and noteworthy achievements in motorless flight. Barnaby held U.S. glider license #1. He was the first American to break Orville Wright's 1911, 9-minute and 45-second soaring flight at Kitty Hawk, NC. He flew a German Pruefling glider 15 minutes and 6 seconds over the dunes of Corn Hill, Cape Cod, MA, in 1929. Both Cedric Vernon and Frank Irving have garnered extensive academic credentials, and are



1998 speakers, Frank Irving, right and Cedric Vernon view sculpture and painting of Capt. Ralph S. Barnaby. (Staff photo)

Reception preceding the Barnaby Lecture. Inset, speakers: top left, Frank Irving, bottom right, Cedric Vernon.

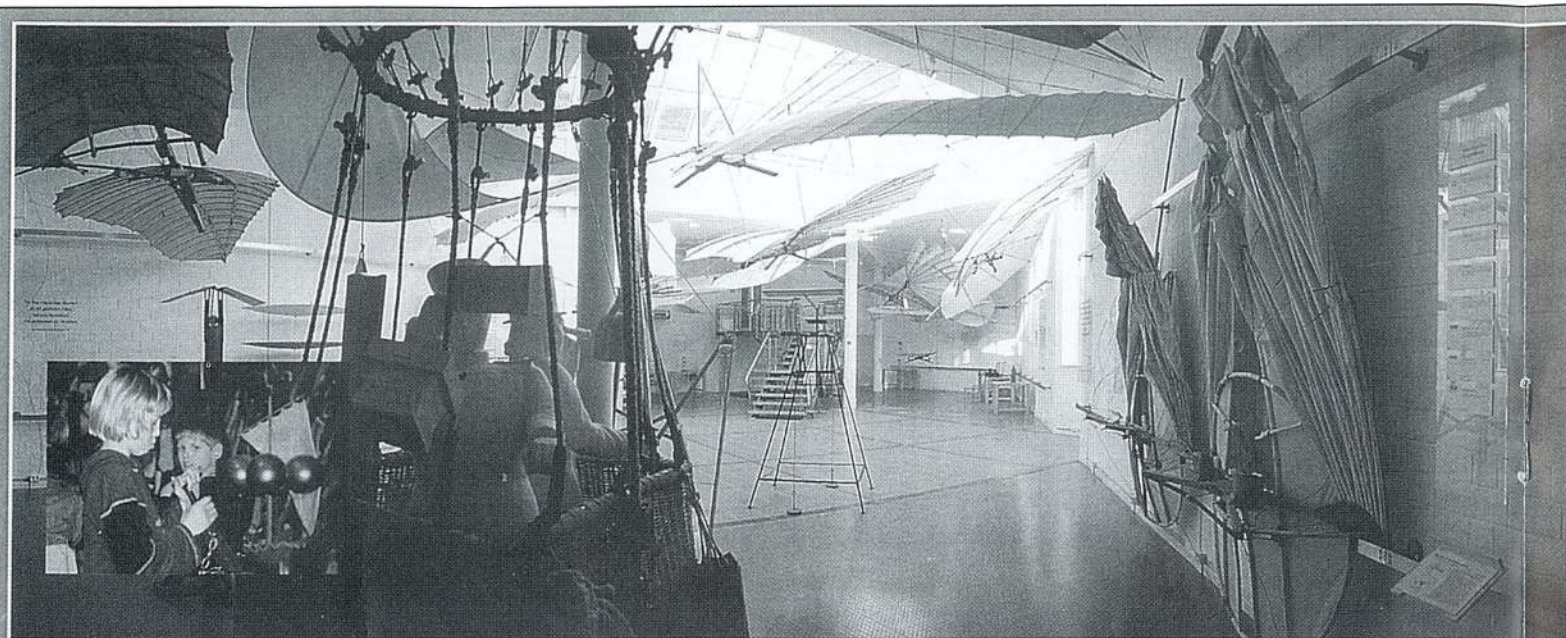
Fellows, Royal Aeronautical Society (FRAeS) and Chartered Engineers (Ceng).

Cedric Vernon has been associated with Britain's prestigious Handley Page, Ltd. (aircraft manufacturers for 40 years), most recently as Assistant Chief Designer in Aerodynamics. For 10 years he was with the Civil Aviation Authority and accumulated 1,025 hours gliding, including 95 as a test pilot. He has been a member of the OSTIV Sailplane Development Panel since 1963, and an OSTIV board member from 1968 to 1973. Vernon was OSTIV Editor, and received the following awards and recognition: RaeS Pilcher Memorial Prize, The FAI (Federation Aeronautique Internationale) Diploma Paul Tissandier, the OSTIV Plaque and Klemperer Award, the Soaring Society of America Exceptional Service Award and the Royal Aero Club (RaeC) Bronze Medal.

Vernon keyed his remarks saying that, "There would be neither a wholly scientific discourse, nor yet quite an FDR-type fireside chat, but rather a mixture of things that occurred, or as a result of some test flying in the sixties and seventies."

He quickly whisked his audience back to the 1950's when there was much talk of aerodynamic polar performance curves, but very

Continued on page 12



OTTO-LILIENTHAL-MUSEUM STADT ANKLAM

23 May 1998: The 150th Birthday Party at the Otto-Lilienthal-Museum in Anklam, Germany

It is only natural to celebrate a birthday. This is an especially good reason if it is the 150th birthday of an aviation pioneer who is still considered a very important part of flying's early development. Anklam, a small farming town in northeastern Germany, and the Otto-Lilienthal-Museum, decided to honor their famous son, Otto Lilienthal, with a special kind of birthday party. This is my report.

The Otto-Lilienthal-Museum moved into the building of the former Anklam Local Historical Society and opened its doors in 1991 in conjunction with the celebration of "100 Years of Manflight." In 1996, it was honored as an F.A.I. Recognized Museum. The museum is constantly looking for improvements and changes in their displays. Eight original-size Lilienthal machines

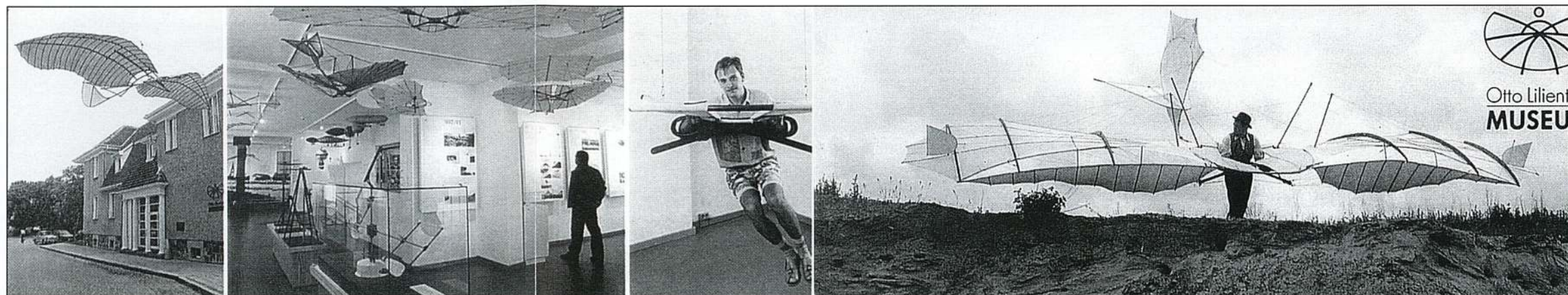
by Simine Short, Chair Nat'l Landmark of Soaring

are currently displayed, several of which are actually in air-worthy condition, built and test flown by Stephan Nitsch of Magdeburg. Six other machines are shown as smaller-size models. As a hands-on exhibit, a Lilienthal glider ground simulator lets visitors practice how to control a Lilienthal-type glider by hanging by the arm-pits and moving body and legs, realizing soon how difficult this is. The newly created museum's home-page on the internet (<http://home.t-online.de/home/LilienthalMuseum/index.htm>) gives photos and precise information about all the machines designed and built by Otto Lilienthal, but there are also links to other historical information and air museums world-wide. Their goal is to be nominated for the "European Museum of the Year Award" in 1999. An ambitious goal and program!

Having celebrated the 100th anniversary of manflight in 1991,



Otto Lilienthal-Museum Anklam, a drawing by Erich Wagner.



Left to right: The Otto Lilienthal-Museum building; the exhibit hall where meetings were held; the museum's Lilienthal simulator and one of the replicas, ready to be test flown.

and the 100th anniversary of Lilienthal's death in 1996, the director of the Otto-Lilienthal-Museum in Anklam, Dr. Bernd Lukasch, tried to look into the future with Lilienthal's 150th birthday.

Everyone will celebrate the 100th anniversary of the Wright Brother's achievement in 2003, so why not be the first museum to arrange a colloquium with international speakers pointing towards the success of the Wrights'. After all, the Wrights were students of the School of Lilienthal and they used his information as they progressed toward their successful flying machine.

County, state and national government officials were asked to participate. It was a good introduction to let everyone realize that this colloquium is a community effort.

Several generations of Lilienthal family members, young and old, were invited to Anklam, the city where Otto Lilienthal was born.

On Saturday, 23 May, about 120 people from all parts of Central Europe came to Anklam, including several glider pilots known to us in the USA: Klaus Heyn and his wife Renate came from Stuttgart and Otto Bellinger from Heilbronn.

The City of Anklam arranged a small celebration with the boys choir and laying of flowers in front of the memorial plaque placed where Lilienthal was born. The house was destroyed during World War II.



Simine Short (Staff photo; All Otto-Lilienthal-Museum graphics provided by Ms. Short)

Seven speakers were invited to the colloquium. The suggested topic for each presentation was simply a connection between Lilienthal and the Wrights.

Werner Schwipps, from Cologne, Germany, is known world-wide as the authority on Otto Lilienthal. He has written many books and articles on Lilienthal's contribution and achievements. The only problem for us in the U.S.: they are all written and published in the German language. The title of his talk was "Lilienthal and the Americans and vice versa." It is a widely accepted fact that Lilienthal paved the way from a "Wish to Fly" to a "To Fly." The Wright

Brothers followed the school of Lilienthal, gaining experience in building and then flying gliders and, seven years after Lilienthal's death, in achieving powered flight.

In the 1890s, there were three serious aeronautical centers in the United States. Prof. Samuel Pierpont Langley in Washington, Secretary of the Smithsonian Institution, who visited Lilienthal in Berlin, but did not think that he could learn anything from him he did not already know; Octave Chanute in Chicago who not only corresponded with everyone world-wide about aeronautical problems but also experimented with flying machines; and James Means of the Aeronautical Society in Boston. Means invited Lilienthal, all expenses paid, to come to Boston for a few months to teach young Americans the secrets of glider building and flying. Unfortunately, Lilienthal could not get away from his business at that time, and a few months later he died.

What did the Wrights know of Lilienthal's work? After the first few years of experimenting with kites and small paper helicopters, they contacted the Smithsonian Institution and asked for information. Publications from Means and Chanute were mailed; translations of Lilienthal's publications were part of this package. The Wrights used Lilienthal's data tables extensively. They initially reported to Chanute that they did not trust the data, but they always went back to the information and thought very highly of Lilienthal's work.

In 1904, the Wrights applied for a patent on their flying machine in Germany; in 1906, they offered the German Military their machine; in 1909, the Wright Flying Machine Company was founded. About 60 flying machines were built, sold and flown successfully in European air meets. The Wrights frequently came to Berlin. They also visited Lilienthal's widow Agnes and Otto's grave site. Seeing that she had financial problems, the brothers sent a check for \$1,000 to Mrs. Lilienthal and her four children, a very needed and appreciated Christmas present!

The next speaker was Simine Short, author of this article, and chair of the NSM's National Landmark of Soaring committee. Greetings from Dr. Tom Crouch, National Air & Space Museum, and Jeff Byard, President of our NSM were given. The National Soaring Museum assembled a complete set of NSM Historical Journals to give to the Lilienthal Museum library. It was a welcomed gift.

The title of her talk was "Octave Chanute, from Lilienthal to the Wright Brothers." Chanute corresponded with and collected aeronautical information from pioneers and would-be pioneers world-wide. This correspondence is still being used by today's researchers. Chanute can easily be considered the link between Lilienthal in

Continued on page 10

Germany and the Wrights in the United States. His book *PROGRESS IN FLYING MACHINES*, published in 1894, was widely read. Also, he had all articles by Lilienthal translated and published; certain chapters and tables of the book *VOGELFLUG ALS GRUNDLAGE DER FLIEGEKUNST* (or Birdflight as the Basis of Aviation) were translated and distributed freely, including to the Wrights.

Chanute's life was a colorful one, first as a civil engineer in the railroad industry, then as a designer of railroad bridges using the Pratt truss technology, as a consulting engineer in the wood preservation for railroad ties, and as an aeronautical engineer. In 1896 and 1897, to keep up with technology, he financed gliding camps in the sandy dunes along the southern shore of Lake Michigan. Several gliders were designed, built and flown. A National Landmark of Soaring was dedicated at the site of the 1896 camp, honoring Chanute's contribution and the design of the biplane glider, using the Pratt trussing, like in his bridge designs. At that time it was the most successful heavier-than-air flying machine in the world. "It proved to be a key step on the road to the invention of the airplane, and was used by the Wrights in their initial design." (quotation from



Lilienthalstadt Anklam
Otto Lilienthal portrait; a postcard sponsored by the city of Alkham.

– Lilienthal and the Wright Brothers" covered a very different approach to the history of aviation. He studies scientists and inventors whose creative acts have contributed so much to human kind, especially by looking at the efforts to develop the airplane.

He described two methods generally used, and these two recipes can be applied to invent almost anything.

The first method is a simple "design, build, test and refine" loop. Even though this seems like a straight forward practice, he explained some shortcomings. Many aeronautical pioneers used this as their standard method. Bradshaw showed pictures of the different flying machines which were not so successful and explained why they failed.

The other method employed is called "Functional Decomposition," and this is the method used by the Wrights. Here, the final product is being analyzed and broken down into "functional elements." The functions of each subsystem have to be determined, understood and measured independently. Then, each element is tested in isolation and perfected before being assembled into the "perfect machine." Lilienthal built himself a swirling arm device to test the lift and drag of wings and other surfaces. The Wrights used

Tom Crouch, OCTAVE CHANUTE (1992).

Her talk was highlighted with overheads, including reproductions of clippings of Lilienthal articles, published in the United States.

Dr. Gary Bradshaw of the University of Illinois, Urbana-Champaign, and author of the "To Fly is Everything" virtual museum on the internet, gave his talk in the English language, with Simine Short translating. Watching the facial expression of the audience, it seemed that most everyone did not really need a translation. As Dr. Bradshaw is a psychologist, interested in creativity, his talk "The Logic of Invention

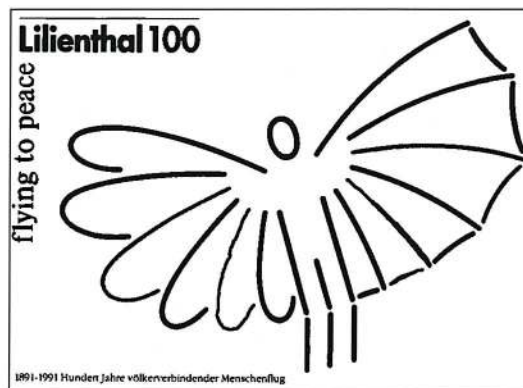


Fig. 3
"Flying to Peace," the 1991 winning poster design by Professor Otto Kummert.

and relied on this data in the first two years of their experimenting, but then questioned the accuracy. They then built themselves a wind tunnel, verifying the data, and realized that the coefficient of lift was too large. Each functional element of their airplane was tested and diagnosed, until it was perfected. Curiously, the Wrights' doubts about Lilienthal's published results forced them to take seriously the task of component testing, resulting in a more thorough application of this new method.

The final presentation of the afternoon was a reading "Lilienthal" by three actors of the Vorpommern Regional Theater Company Anklam (Vorpommersche Landesbuehne Anklam). They were dressed in costumes of the turn of the century and discussed the "value of inventing a flying machine," as it could have been done by common folks during Lilienthal's life. This was a charming ending of an aeronautical seminar.

In the early evening hours, a reception was hosted at the Graphic and Design School in Anklam. As part of the 150th Birthday of Lilienthal, the exhibit "The Poster Flies" was opened to the public. Posters with an aviation theme of the past 80+ years were on display, some on loan from the German Technical Museum Berlin, others from the collection of Werner Schwipps. The director of the school, Professor Otto Kummert, explained the simple and effective art of posters. Two posters, produced for the 1991 design competition "Flying to Peace," were of special interest to me and they are shown, the 1991 winning poster design shows a stylized flying machine (note the rounded bird-wing design on the left and the angled artificial wing on the right) by Otto Kummert (Fig.3), and the design by his daughter,



Fig. 4 "Who was Mrs. Lilienthal?"
A proposal for the same, "Flying for Peace" poster designed by, Ma. Anke Feuchtenberger.

Anke Feuchtenberger "Who was Mrs. Lilienthal?" Ms. Feuchtenberger's poster needs no further explanation (Fig.4). The seminar continued the following day, Sunday, after a champagne reception in the Museum, sponsored by the Mayor of Anklam.

Tony Prentice, a hang-glider pilot from Darrenth, United Kingdom, presented his talk "Flying like a Bird – my trials with a Lilienthal/Pilcher replica" in English, talking about his flying experiences and showing photos of his machine and also some

Continued on page 11

video clippings.

The next speaker was Dr. Wolfgang Send, a theoretical physicist at the Institute for Aeroelastics, DLR, in Goettingen, Germany. He is currently studying and researching the flapping wing problem, especially how it can be used in today's airplane wings. The title of his presentation was "Otto Lilienthal and flight with flapping wings, or the physics with a new experimental device."

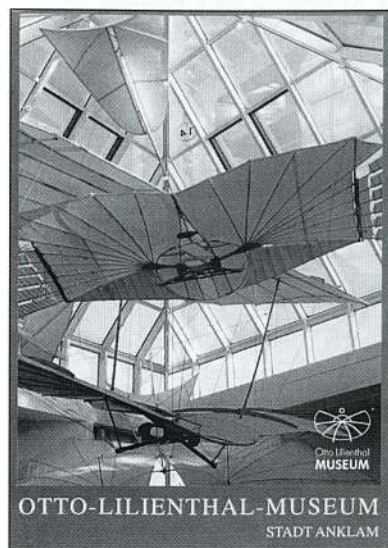


Fig. 5 Two full-size Lilienthal replicas hanging inside the glass dome of the museum's exhibit hall in which meetings were held.

Lift and drag is common knowledge today, but this was not the case 100 years ago. Lilienthal established data for these values on flat and curved wing surfaces and published them in his book **VOGELFLUG** (Birdflight) which was publicized widely. Dr. Send did a wonderful job in explaining the basic laws of physics to the general audience. He then set-up his whirling arm device to explain the flapping wing mechanism, how it was determined by Lilienthal and

especially, how it could be used effectively in the wing design of modern airliners of today. Even though the subject first appeared to be "dry science," he was able to relay the fundamental thoughts and everyone walked away with a good feeling: why not try it?

The final speaker of the day was our host, Dr. Bernd Lukasch, executive director of the Otto-Lilienthal-Museum, with his presentation of "From the Museum's Holdings, the undulating propeller (Wellpropeller) design by Dr. Wilhelm Schmidt, Dresden." Here a different approach to a propeller design was explained and the original experimental device, built in the 1950s, was demonstrated. Schmidt refined his design over the years and promoted it, but it has never really been successfully applied in today's world.

Considering the colloquium as a whole, it was interesting how many speakers discussed the Lilienthal - Wrights connection in so many different ways, bringing something new to everyone interested in the development of the flying machine. Fig.5 shows the exhibit hall which became the auditorium for this weekend. The audience sat beneath the Lilienthal machines. Was Otto Lilienthal watching through the glass windows above?

After a quick snack in a local restaurant, most participants drove back to the museum. During the next few hours, they held an informal "round-table discussion" with everyone getting to know each other much better. It seemed that there was no barrier of language at all. The weekend in Anklam was considered by participants and visitors as an interesting and enjoyable event. I was proud to represent the NSM in Germany.

Members of the Sailplane Development Panel of the Organisation Scientifique et Technique Internationale du Vol a Voile at their September 1998, meeting at the National Soaring Museum. Back row, left to right; William Scull, Great Britain, Francois Ragot, France, Cedric Vernon, Great Britain, Michael Rehmet, Germany, Gerhard Waibel, Germany, John Ashford, Australia, Cristophe Kensche, Germany, Helmut Fendt, Germany, Dan Armstrong, United States. Front row, left to right; Oran Nicks, United States, Anthony Segal, Great Britain, Frank Irving, Great Britain, Jan-Eric Ollsson, Sweden, Petr Kousal Czech Republic, Olexiy Dushyn, Ukraine, David Marsden, Canada, Lubomir Olsan, Czech Republic. (Staff photo)



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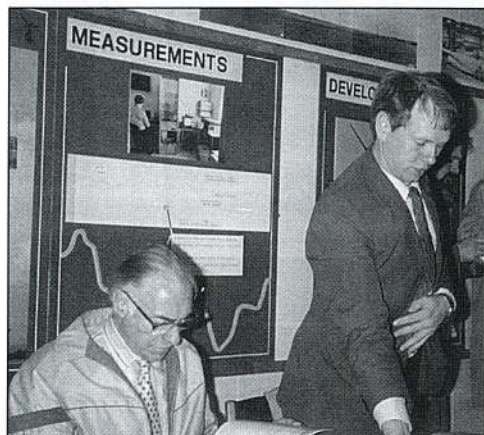
Publisher - National Soaring Museum
James W. Swinnich - Executive Director
Editor & Layout - Bill Gallagher

The National Soaring Museum is an affiliate of The Soaring Society of America, and, as such, is the official repository for all its documents and artifacts.

Continued from page 7

few had been made. In 1960 the British Gliding Association (BGA), No. 3 Test Group (Dunstable) made performance tests on a Slingsby Sky 2. He said, "These tests were duly made on the London Glider Club glider BGA 759. The complete report was never published." Then for the record, Vernon discussed the principal technical results from the 175 runs.

He next discussed his testing an open cockpit Slingsby Cadet. The ship had been cleared by the manufacturers for aero-towing but had never been flown in that configuration. A wing drop oscillation problem was observed during the testing. At his suggestion the ailerons were re-rigged "nominally neutral" on the ground,



Left, Cedric Vernon at the 1990 OSTIV meeting at Riso, Denmark, Right Jan Eric Ollsson, of Sweden. (Vernon photo)

making them "lighter and much more pleasant." The adjustment was completely successful in curing the oscillation.

Vernon detailed his testing the spinning behavior and flight characteristics of the Slingsby T-21C and 1965 TypeKK. The latter, similar to the American Schweizer 2-22, was built as an exercise in metal construction.

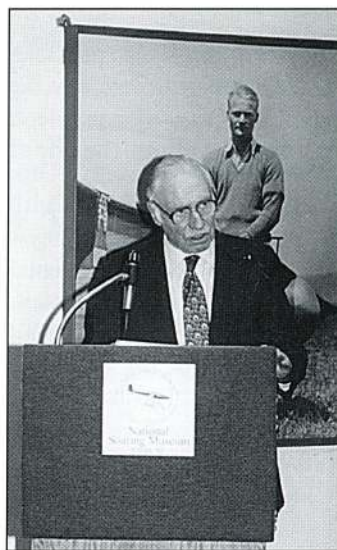
He mentioned a couple of high speed incidents. After pulling out of a dive, testing a Slingsby, "I became aware of a vibration when a steady glide was re-established. At first I wondered if something had come adrift. A quick wiggle confirmed that all the con-



1989, OSTIV meeting at Weiner Neustadt, Austria. Frank Irving, far left, Cedric Vernon, right. (Vernon photo)

trols were still working. For a few seconds I was worried. Then, I noticed that the air brake lever was still in the open position. After retraction all was well. Panic over!" he laughed.

The other high-speed incident occurred on a glider known as the Dunstable Kestrel, a swept-wing forward, tandem two-seater, built by members of the London Gliding Club. After five years a-building, Vernon who had a hand in the ship's design, joined the owners in Certificate of Airworthiness tests.



Cedric Vernon delivering the 1998 Barnaby Lecture. (Staff photo)

(porpoising) problems. After several tests, Vernon said, "I did not feel justified in recommending other than a Restricted Certificate of Airworthiness."

The next Barnaby lecturer, Francis G. Irving joined the Imperial College Gliding Club in 1946, the same year that he was awarded a diploma in aeronautics. He was a lecturer in the Imperial College's Department of Aeronautics, initially in Aircraft Performances and Supersonics and later in Flight Mechanics. He designed two supersonic wind tunnels, the second of which was the largest university tunnel in the United Kingdom. In 1955 he made the first two-place sailplane crossing of the English Channel, with noted gliderman Lorne Welch.

In the '50s and '60s he was Chairman of the BGA Technical Committee. In 1961 he was awarded the Paul Tissander Diploma of the FAI. In 1965 he became Deputy Director of the World Gliding Championships at South Cerney, England. In the 1970's he spent four months at Brazil's Centro Tecnico de Aeronautica. He was awarded a diploma of OSTIV in 1983, and retired from the Imperial College in 1989. He is current president of the Imperial College Gliding Club. Irving opened by noting that his college gliding club is not confined to the Aero Department, but has a wide membership from all departments.



Frank Irving in his Kirby Kite, at Lasham, England, circa. 1953. (Irving photo)

In April, 1930, "With a great outburst of optimism," The Imperial College Technical Committee recommended building three ma-

Continued on page 13

chines, a primary, a secondary, and a sailplane. Irving smiled as he said, "About 6 pounds UK (around \$25 at that time) was earmarked for the construction of an advanced machine. The intention was to build them, as opposed to buying them off the shelf. In those days about the only type of machine one could buy was the RFD primary. The resulting primary ("The Incredible") was built from materials given by the Rector and members. The Rector was Sir Henry Tizard, later famous for supporting radar and the Whittle jet engine projects.

The IC-1 was taken, not quite completed, to summer camp where Imperial College members worked on it while also working on a farm to pay their rent. Rules were drawn up, "which seemed obsessed with healthy food and the avoidance of strong drink." Irving mused. Continuing, he said, "The IC-1 was blown over in a strong wind. The occupant, one Hewson, was also inverted and landed on his head. He was put to bed and his trousers removed to keep him there. He was reported satisfactory in a day or so."

Recalling events of the early days, Irving said, "Crashes were frequent, but caused little injury, because nearly everything went on at no great height and speeds were very low. The cost of repairing the damage was quite low as well, despite the complexity of the wing structure," (referring to the College's crashed IC-2 glider.)



Frank Irving flight testing the Slingsby Sparrow, circa. 1955, Lasham. (Irving photo)

After much discussion, in 1934, an affiliation with the London Club was agreed upon and a Kirby Kite was added. With the advent of WW II, all "Kites" were rounded up by the Air Ministry and formed the beginning of the Glider Pilot's Regiment. Irving sighed and said, "It was here that the I.C. Kite came to an end, the pilot entering the Officer's Mess without divesting himself of the glider



Frank Irving in the Pegase 10, Gap, France, 1995. (Irving photo)



Left to right, William Scull, with NSM's Director of Development Jaye Fish, Brian Utley, Frank Irving and Cedric Vernon. (Staff photo)

first."

Postwar, the club was reformed with two elementary gliders and a winch. It re-affiliated with the BGA. Pioneering flight instructors Lorne and Ann Welch trained Imperial College pilot hopefuls in the club's two-place Slingsby T21b, affectionately called "Daisy."

Congestion at IC's Redhill Field forced a move. There followed an upgrading sailplane turnover: an Eon Olympia, a Skylark II, a Slingsby Eagle, a Skylark 4, a half-share in a Schleicher K-13, and a K-8. "In 1972, another single-seater was thought to be desirable so my syndicate sold the Club our Slingsby Dart 17R," Irving said.

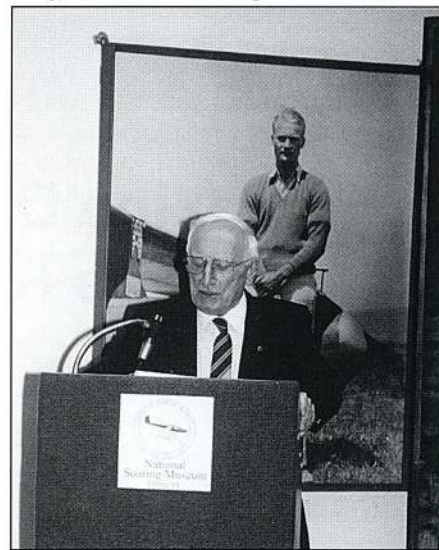
After only two months' service both the Club's K-8 and Astir were damaged by the trailing vortices behind a Dan-Air jet taking off in the opposite direction. The Skylark ended its career in a cloud flying accident.

The insurance money was used to purchase a Club Libelle. The club's replacement for the Astir, a Schleicher ASW-19 was successful in several competitions.

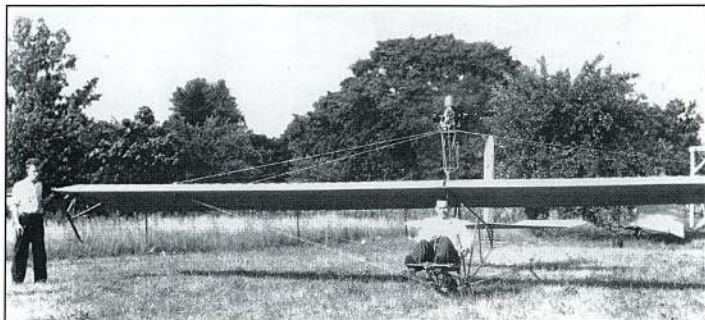
In 1986, it was flown over Mont Blanc by Martin Judkins who gained a FAI Diamond height in the process.

Since then the Club has been on expeditions to Gap, in southern France, and Le Blanc. In 1992 the Club purchased a modern two-seater, the Grob-103.

Last year, the Club's Schleicher ASW-24 was flown by Afandi Darlington to 7th place in the Junior European Championships. Irving closed by saying, "Now we have an enviable fleet of gliders, the ability to make the greatest of flights, and splendid instrumentation. We can only hope that the Club manages to survive the present enthusiasm for underfunding universities. We are seeking sponsorship."



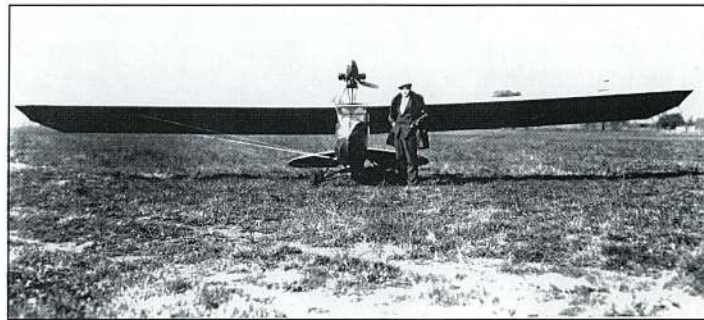
1998 Barnaby Lecturer, Frank Irving. (Staff photo)



Letter to The Editor
From Felix Chardon, New Hope, PA

I just received the NSM JOURNAL with the article on motorgliders. This was a great comprehensive study of same and involved considerable research.

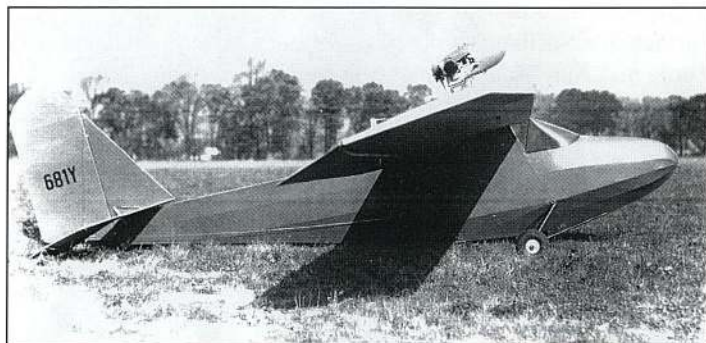
However, I note that no mention was made of the WACO experiments in 1930+. Enclosed are photos of several configurations which were tried. These were modifications of the WACO Primary model



NAZ. As far as I know none were put into production. I believe there is original film of these in flight at the WACO Historical Soc. Museum in Troy, OH.

Incidentally, I donated The WACO primary reproduction to the WACO Museum. I completed the structure to the point of covering, but time and physical limitations prevented me from covering the wing and tail. The WACO Museum promised to cover it as soon as their restoration shop is completed.

Here are some photos of that. Best Regards, Felix



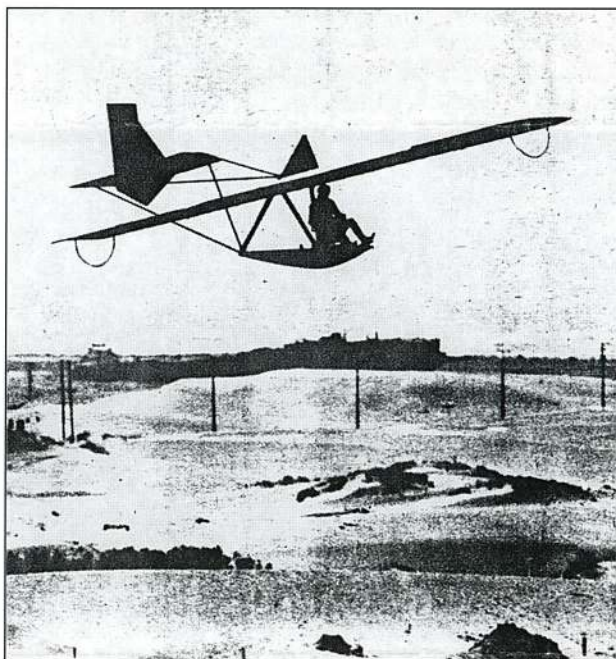
Maxine Dunlap: The First U.S. Woman To Receive A Glider License



The caption under the May 5, 1929, Pacific and Atlantic Assoc. photo moaned, "Another stronghold gone. Maxine Dunlap, already a licensed aviator, took a glider flight at San Francisco and her success entitles her to the first U.S. glider license for women. There's nothing left for the poor men to claim for their very own these days!"

January 22, with only 9-1/2 hours of instruction and on her first solo flight WASHINGTON POST artist Robert Edgren sketched Maxine Dunlap waving from an invert biplane. She "looped the loop and performed several tail spins at Mills Field San Francisco," the artist penned.

At the time of her glider flight, the 21 year-old Dunlap of Oakland, CA, had logged more than sixty hours flight time in power planes. On her 50-second glider flight over the beach in what appears to be a Ferguson Primary, she travelled slightly over 900 feet. It was reported in a PHOTO SHOWS news release, that she, "succesfully executed two 'S' turns before landing. The test was made under the auspices of the National Aeronautics Association and the National Glider Association."



Maxine Dunlap in the Ferguson Primary.

MILESTONES IN GLIDER HISTORYTHE FIRST 30 YEARS

*A Condensed Summary
from Edwin W. Teale's,
"The Book of Gliders" (1)*

A 1922 view from the Wasserkuppe. The "Hanover" at top and "Darmstadt," below, ridge soaring. (NSM Archive photos)

Duration

1884. John J. Montgomery. Oatay, California. Own construction glider. Duration unknown.
1891. Otto Lilienthal. Rhinow, Germany. Own construction. Approximately one minute.
1895. Percy Pilcher. Cardcross, Great Britain. Own construction, "the Bat," 20 seconds.
1896. Octave Chanute. Miller, Indiana. Own construction. Duration unknown.
1900 October. Wright Brothers. Kitty Hawk. Own construction. Duration unknown.
1902. August. Wright Brothers. Kitty Hawk. Own construction. 26 seconds.
1903 January. Wright Brothers. Kitty Hawk. Own construction. 1 minute, 12 seconds.
1911. October, 24. Orville Wright. Kitty Hawk. Own construction. 9 minutes, 45 seconds. First soaring flight.
1912. Hans Guttermuth. Wasserkuppe, Germany. "Darmstadt." 1 minute, 112 seconds.
1921. August 30. Klemperer. Wasserkuppe, Germany. "Blue Mouse." 13 minutes.
1921. September. Martens. Wasserkuppe, Germany. "Vampyr." 15 minutes, 40 seconds.
1921. September 13. Harth. Heidelberg-Rhoen, Germany. Own construction. 21 minutes, 30 seconds.
1922. August 18. Martens. Wasserkuppe, Germany. "Vampyr." 1 hour, 6 minutes.
1922. August 19. Hentzen. Wasserkuppe, Germany. "Vampyr." 2 hours.
1922. August 24. Hentzen. Wasserkuppe, Germany. "Vampyr." 3 hours, 6 minutes.
1922. September, 22. Maneyrol, France. Itford Hill, England. "Peyret-Tandem." 3 hours, 21 minutes.
1923. January. Thoret. France. Vauville, France. "Hanroir." 7 hours, 3 minutes.
1923. January. Maneyrol. France. Vauville, France. "Peyret." 8 hours, 36 minutes, 50seconds.
1923. January 21. Barbot. France. Vauville. "Dewoitine." 8 hours, 35 minutes, 56 seconds.
1924. May 18. Ferdinand Schultz. Germany. Rossitin. Own con-

struction. 8 hours, 42 minutes.

1925. July 26. Massaur. Belgium. Vauville, France. "Poncelet-Vivitte." 10 hours, 29 minutes.

1925. October 2. Schulz. Germany. Krim. Russia. "Moritz." 12 hours, 6 minutes.

1927. May 3. Schultz. Germany. Rossitin. "Westprussin." 14 hours, 7 minutes.

1928. July 29. Peter Hasselbach. Germany. Cape Cod, Massachusetts. "Darmstadt." 4 hours, 5 minutes.

1929. August 18. Ralph Barnaby. United States. Cape Cod, Massachusetts. "Pruffling." 15 minutes, 4 seconds. First American to break Orville Wright's 1911 record.

1929. October 20. William Hawley Bowlus. United States. Point Loma, California. Own construction. 1 hour, 21 minutes, 9 4/5 seconds.

1929. December 10, Bowlus. United States, Point Loma, California. Own construction. 2 hours, 47 minutes, 13 seconds.

1929. October 19-20. Hermann Dinort. Germany. Rossitin. Own construction. 14 hours, 43 minutes, 25 seconds.

1930. January 13. Bowlus. United States. Point Loma, California. 6 hours, 19 minutes, 3 seconds.

1930. February 23-24. Bowlus. United States. Point Loma, California. Own construction. 9 hours, 5 minutes, 27 seconds.

1930. April 29-30. Jack Barstow. United States. Point Loma, California. Bowlus sailplane. 15 hours, 12 minutes.

Continued on page 16



Towed Glider Flights

1896. Pilcher. Great Britain. Cardross. Own construction. Towed by horses and boys pulling on ropes.
 1928. Espenlaub. Germany. Berlin. Own construction. First towed flight behind an airplane.
 1928. Dale Drake. United States. Reedley to Long Beach, California. Own construction. 200 miles
 1929. Wolf Klemperer. Germany. "Akron Condor" Akron, Ohio to Cleveland, Ohio. Towed by a blimp.
 1930. Frank Hawks. United States. San Diego, California to New York City. Franklin "Eaglet." First transcontinental glider flight towed behind an airplane.

Altitude

1884. Montgomery. United States. Otay, California. Own construction. Altitude unknown.
 1891. Lilienthal. Germany. Rhinow Hills. Own construction. Altitude unknown.
 1903. Wright Brothers. United States. Kitty Hawk. Own construction. More than 50 feet.
 1905. Maloney. United States. Santa Clara, California. "Montgomery." 4000 feet. (Attached to balloon)
 1922. August 18. Martens. Germany. Wasserkuppe. "Vampyr." 354 feet.
 1922. August 19. Hentzen. Germany. Wasserkuppe. "Vampyr." 656 feet.
 1922. August 24. Hentzen. Germany. Wasserkuppe. "Vampyr." 1,148 feet.
 1923. February 7. Descamps. Feance. Biskra, Algeria. "Dewoitine." 1,790 feet.
 1925. July 26. France. Vauville. "Peyret." 2,361 feet.
 1928. August 8. Dittmar. Germany. Wasserkuppe. "Albert." 2,542 feet.
 1929. October 7. Klemperer. Germany. Uniontown, Pennsylvania, "Akron Condor." 600 feet.
 1929. October 20. Bowlus. United States. Point Loma, California. Own construction. 750 feet.
 1929. April 25. Nehring. Germany. Bergstrasse. "Darmstadt." 3,965 feet.
 1929. July 30. Kronfeld. Austria. Wasserkuppe. "Vienna." 7,084 feet.
 1930. January 13. Bowlus. United States. Point Loma, California. Own construction. 1,500 feet.

Distance

1884. Montgomery. United States. Otay, California. Own construction. 600 feet.
 1891. Lilienthal. Germany. Rhinow Hills. Own construction. 900 feet.
 1902. Wright Brothers. United States. Kitty Hawk. Own construction. 1000 feet.
 1905. Maloney. Santa Clara, California. "Montgomery." 8 miles. (From balloon)
 1912. Hans Gutermuth. Germany. Wasserkuppe. "Black Devil." 2,764 feet.
 1920. September 4. Klemperer. Germany. Wasserkuppe. "Black Devil." 1.13 miles.
 1921. September 5. Martins. Germany. Wasserkuppe. "Vampyr." 4.65 miles.
 1922. August 19. Hentzen. Germany. Wasserkuppe. "Vampyr." 5.58 miles.
 1923. Botsch. Germany. Wasserkuppe. "Konsul." 10.61 miles.
 1924. Schultz. Germany. Rossitten. Own construction. 4 miles.
 1924. October 14. Martins. Germany. Monte Massa, Italy. "Motitz." 11.92 miles.
 1925. Nehring. Germany. Krim, Russia. "Konsul." 15.15 miles.
 1926. Kegel. Germany. Wasserkuppe. Own construction. 34.28 miles.

1927. Schultz. Germany. Wasserkuppe. Rossitten. "Westpreussen." 38.62 miles.
 1928. Nehring. Germany. Wasserkuppe to Treffurt-near-Eisenach. "Darmstadt." 44.21 miles.
 1929. October 7. Klemperer. Germany. Uniontown, Pennsylvania. "Akron Condor." 15 3/4 miles.
 1929. April 25. Nehring. Germany. Malchen to Upstadt. "Darmstadt." 44.81 miles.
 1929. May 15. Kronfeld. Austria. Wasserkuppe. "Vienna." 64.34 miles.
 1929. July 20. Kronfeld. Austria. Wasserkuppe. "Vienna." 88.8 miles.
 1929. July 30. Kronfeld. Austria. Wasserkuppe. "Vienna." 93.15 miles.
 1930. June 15. Kronfeld Austria. Itford Hill to Portsmouth, England. "Vienna." 70 miles.

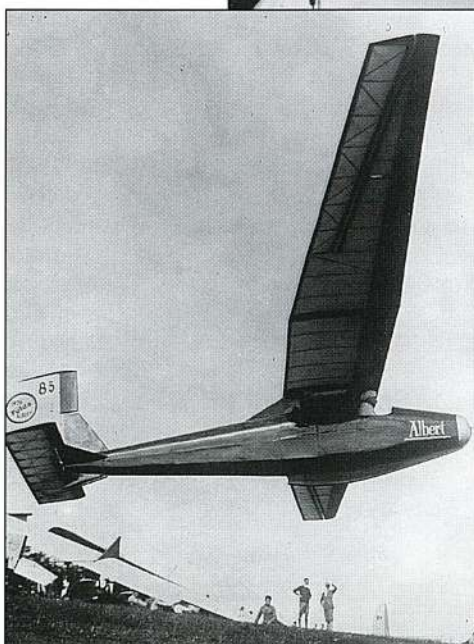
Distance in closed circuit.

1927. May 3. Schultz. Germany, Rossitten. "Westpreussen." 283.05 miles. (Flew 14 hours, 7 minutes)
 1930. Bowlus. United States. Point Loma, California. Own construction. 150 miles. (Flew 9 hours, 5 minutes.)
 (1) THE BOOK OF GLIDERS, by Edwin Way Teal, E. P. Dutton, New York, pub., 1930, pgs. 373-379.



Top:
Wolf
Klemperer in
his "Blaue
Maus."

Right:
Robert
Kronfeld
in "Wien."



Left:
Dittmar being
shock-corded off
in "Albert."