

# A FORGOT



The Heliplane hovers about a foot off the ground. Ropes and sandbags prevent the aircraft from rising too far into the air.  
House Historic Centre / Charlotte M. Hess Photos

# TEN PAST

## ONE OF THE FORGOTTEN PIONEERS OF THE CANADIAN HELICOPTER INDUSTRY IS JOHN E. HESS SR., WHOSE HELIOPLANE CONCEPT MARKED THE BEGINNINGS OF ROTARY-WING FLIGHT IN CANADA.

by Bob Petite

While the modern helicopter is now a familiar sight in the skies over the United States and Canada, this radical aircraft experienced many growing pains before a successful model was developed — and was accepted by the aviation industry. That's why the commercial history of helicopters is a relatively short one, stretching back less than 70 years.

This is also why many early helicopter pioneers are not well-known — particularly Canadian ones. Few people are probably aware of the contributions made by several Canadians to the design, testing and construction of experimental rotary-wing aircraft during the pre-commercial days of the 1920s and 30s. These pioneers included the Froebe brothers of Manitoba and Nick Duben of British Columbia.

Sadly, one of Canada's earliest pioneers remains its least-remembered. Before the efforts of either Duben or the Froebes, there was the work of John E. Hess Sr. of New Westminster, B.C.

Hess created a prototype aircraft with two lifting rotors that hovered, albeit tethered by ropes, before even Igor Sikorsky's first flight of the VS-300. But, try Googling Hess's name and you'll see how little can be found about this unique and important inventor's work.

### INSPIRATION AND PROGRESS

Growing up in Bavaria, Germany, in the late 19<sup>th</sup> century, Hess became enamored with humanity's early attempts to achieve powered flight. The thought of soaring like the birds fascinated him. He was especially taken by the hummingbird and believed humans would someday invent a flying machine that could emulate this natural marvel.

Immigrating to Canada in 1907, Hess and his family initially started with more practical pursuits: setting up a bricklaying business in their new homeland. But, Hess's thoughts about the ideal flying machine were never far away and he soon began designing a vertical-lift aircraft he would call the "heliplane." In 1912, as work progressed on the design of this concept, Hess solicited other businessmen to join him in his venture so a working model could be constructed. While many thought his ideas had potential, none came forward with the necessary funding. Practicality won out and he shelved his plans for the next several years.

It wasn't until 1927 that Hess would seriously return to his

aviation dreams. With his bricklaying business having flourished, he had been able to set aside sufficient funds for the heliplane project. And by now, his sons John Jr. and Harry, along with his daughter Carlotta, were able to join his pursuit; they set about testing a model in a shed in the backyard of the family home.

More than simply a family project, however, the Hesses took their efforts very seriously: on Oct. 24, 1928, the John Hess Heliplane Co. Ltd. was formed and had a capital investment of C\$70,000. Directors of the company included: John Hess Sr., president; G. Emerson Gilley, vice-president; Alvera Ward, secretary-treasurer; John Hess Jr.; and Francis G. Wrightson. Among the first orders of business was the pursuit of patents for the heliplane.

At the same time, construction and testing of a model propeller/rotor began. To start, an umbrella was used to determine the type of rotor needed. The model rotor blades were then constructed from oilcloth and thin cedar strips, and were attached to a metal disc atop a vertical shaft driven by a two-horsepower engine. Tests showed the motor could lift 16 pounds per horsepower at 250 r.p.m. By varying the speed of the engine, the model rotor could rise and descend vertically.

The aircraft prototype was then constructed around a 28-horsepower, Lawrence, two-cylinder engine. The nine-foot rotor blades were made of drill cloth, cedar strips and wire.

Unfortunately, the very first test ended in disaster, with rotor-blade debris scattered throughout the shed. Large cross-beams in the shed had prevented the machine from rising more than a few inches, which might not have been a problem if the speed of the rotors had not developed an excess of lifting power.

### REFINING THE PROCESS

The Hesses soon constructed new rotor blades. And, subsequent tests were far more successful: with the rotor speed kept to 200 r.p.m., the 530-pound model was able to rise with no problems.

News of Hess Sr.'s experiments began to spread. The local newspaper, the *British Columbian*, published a front-page article on Dec. 17, 1928, that claimed: "John Hess Sr. has perfected a heliplane [that] the inventor predicts will revolutionize aviation. The machine, which combines the principles of a



The final resting place of the Hess Heliplane in 1950 — a junk yard near Vancouver, B.C. It has since disappeared forever.  
Gordon Peters Photo



Hess Heliplane inventor John Hess Sr. (center), with sons Harry (left) and John Jr. (right).  
House Historic Centre / Charlotte M. Hess Photo

helicopter and an airplane, rises vertically, and can be brought down in a space of less than 30-feet square. . . .”

Design-wise, the engine, powering two large rotors, was said to be able to lift four times as much weight per horsepower as an airplane, and use much less fuel, too. The rotor blades, which were designed to work at low r.p.m., were expected to be very quiet. Set at an angle of 15 degrees, the blades were hinged with the trailing edges hanging down when at rest, and horizontal when the aircraft climbed. When descending, the trailing edges were elevated to form a parachute-like shape, which was intended to slow the aircraft down. A large fin between the rotors was used to help stabilize the aircraft during turbulence and when landing; it also had an actual parachute inside its hollow frame that the pilot could release if the rotors were damaged. Aircraft direction was controlled by two horizontal stabilizers at the front and rear, and by a vertical rudder.

Hess believed his design would ensure the aircraft would

An advertising drawing for the Hess Heliplane Company. The aircraft shown is a planned improved version of the Hess Heliplane.  
House Historic Centre / Charlotte M. Hess Photo



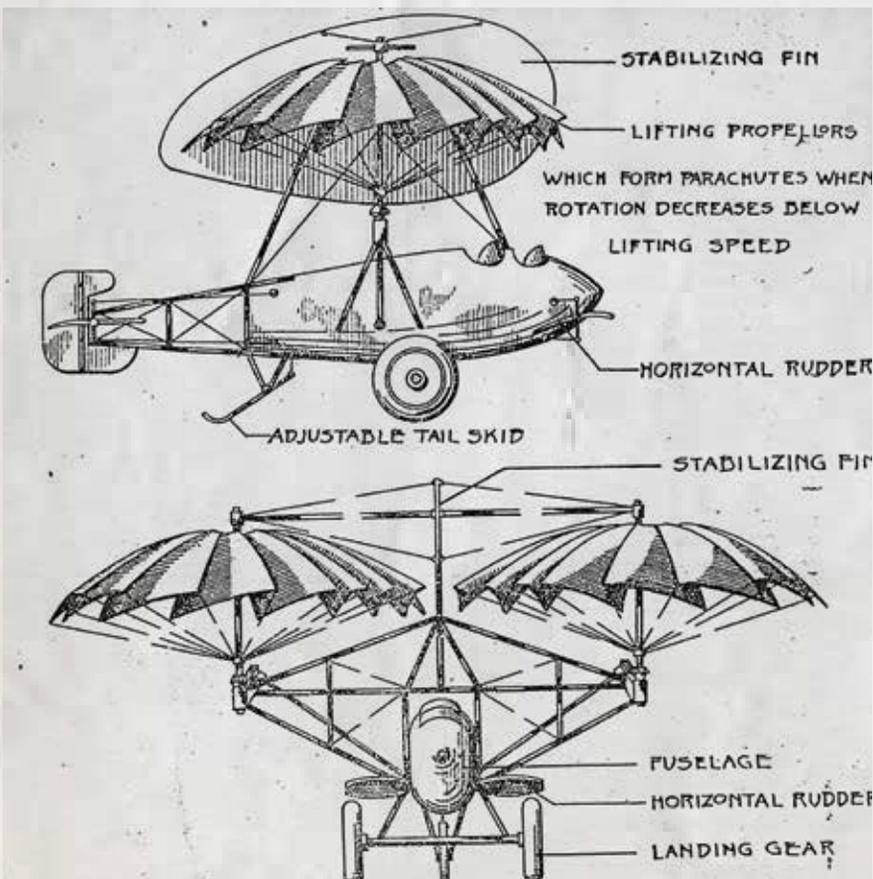
always remain upright, and would float down after an engine failure. And, he intended its purchase cost to be much less than that of a similar airplane.

With everything pointing in the right direction, on May 17, 1929, the company’s board of directors gave Hess Sr. the go-ahead to develop specifications and plans for the construction of a new model.

Meanwhile, patents continued to be received from various countries. Eventually, some 43 countries approved patents — it could have been more, but, as Charlotte Hess, wife of John Hess Jr. noted, “Germany, Russia and Japan were greatly interested in the helioplane, but would not take out the patents unless it was manufactured in their countries. John Hess Sr., although from Germany, wanted to build in Canada, the land of his adoption.”

After some delays obtaining the necessary materials, construction of a duraluminum (aluminum alloy), riveted, angle-bar frame commenced in late 1932, followed by construction of the rotor blades. The new prototype was assembled in 1933, with power coming from a 100-horsepower Kinner engine. During early tests, the helioplane — which at the time had a heavy transmission and as many as eight blades per rotor — would not rise, even after Hess Sr. obtained a 200-horsepower engine. Future revisions saw lighter transmissions and fewer rotor blades, but the final aircraft configuration, with fewer but larger rotor blades, was not established until 1935.

John Hess Jr. was the pilot for the first ground and hover tests, with the first tethered hovering believed to have occurred in July 1935. A photo taken on July 26 had a note on the back that said: “The helioplane hovered approximately 14 inches above the landing platform for four minutes, and then



(Above) A front and side-view drawing of the Heliplane planned for final manufacturing. House Historic Centre / Charlotte M. Hess Photo

by retarding the gasoline control, the machine was lowered . . . and caused to hover for a short time before landing.”

Later that year, Hess Sr. remarked: “Our tests have been very satisfactory. On numerous occasions, the machine has ascended vertically from the ground under its own power, and has hovered as low as one foot from the ground. . . . Up to this point, we have not permitted information regarding the heliplane itself, or its performance, to be printed in the press or motion pictures to appear in newsreels.”

In early 1936, Hess Sr. began looking for opportunities to give demonstrations, seemingly confident in his prototype’s public readiness. In fact, in a report that year, he stated: “Once the propellers have taken the weight of the machine, a very high rate of speed is possible based on the extent of power applied. By manipulating the elevators, the heliplane may be brought into forward or backward flight. Hovering is possible in mid-air at any desired height by simply increasing or decreasing the motor speed. This we have now successfully accomplished.”

**ENCOUNTERING TURBULENCE**

Although everything was seemingly going well for Hess, the ride was about to get very bumpy.

Throughout the next few years, Hess continued to promote the concept to investors and potential buyers, including government officials. After contacting the provincial government, he approached the federal government, hoping to demonstrate how the heliplane could help improve Canada’s defense capabilities. The Minister of Defence, unfortunately, wrote back in February 1938, stating, “No immediate use for the invention as inspected can be visualized either for military

or civil purposes. A satisfactory helicopter may have uses for such purposes as military observation, but it is felt the Hess heliplane is a long way from final development.”

While disappointed, Hess continued testing and revising his design. He tried different types of propellers, extended the width of the aircraft and tested new stabilizers. He also started assembly of a tail unit to govern the lateral stabilizers. He was confident and felt ready to demonstrate the heliplane to others to help find someone to advance his production goals.

While continued testing saw satisfactory progress, with the pilot able to control the aircraft as it rose and hovered, Canada’s deepening focus on the Second World War began to affect further development of the heliplane. It was kept serviced and in running order, for potential demonstrations, but restrictions on fuel and the difficulty obtaining aluminum materials combined to stop all development work. Hess remained optimistic that funds would eventually be released for future aviation research and development, but more bad news was to come.

To aid in his quest, Hess had even approached Igor Sikorsky, sending movies, photographs and experimental data on the heliplane to Sikorsky Aircraft. In April 1941, United Aircraft Corp. (Sikorsky Aircraft’s parent company) wrote back...

The letter stated: “Our engineers in charge of our helicopter project have examined all material with interest. A construction using wide blades rigidly connected to the shaft was considered by Sikorsky but abandoned. The stability automatically obtained by your machine on the pendulum principle is not sufficient to meet all operating conditions. It is nevertheless difficult to form a conclusive opinion since your development work is still in such a preliminary stage.”

It was another big setback for Hess. All work on his prized invention had now come to a standstill. He continued to pitch the concept to others as late as 1943, but eventually his dream was abandoned.

The final known resting place of the heliplane was a junkyard near Vancouver, B.C., around 1950. After that, no one is certain what happened to it. Hess, himself, would pass away just a few years later, in 1954.

While few today know of the man and his work, there is no doubt John E. Hess Sr. left an indelible impression on Canada’s rich aviation history — largely through the other aviation pioneers he inspired.

For anyone who wants to know more about this fascinating man and that exciting time in aviation history, you can visit the Irving House Historic Centre in New Westminster, where all remaining documents, data, photographs and movies of the once-loved Hess heliplane reside.

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