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Sikorsky's was the first practical helicopter, but a different Russian and a younger Air Service got a chopper off the ground in 1922

The Flying Octopus

By C. V. Glines

MOST aviation historians agree that Igor I. Sikorsky deserves credit for designing, building, and flying the first practical helicopter. His XR-4, the first rotary-winged aircraft accepted by the Air Force, weighed 1,900 pounds and could lift 500 pounds of payload. It first flew in January 1942 and was demonstrated to Gen. Henry H. "Hap" Arnold the next July. General Arnold liked what he saw. "The Army Air Force," said he, "has taken flyers before with not so much gain promised."

One "flyer" to which General Arnold may have been referring was an earlier helicopter venture. Sikorsky's helicopter was not the first bought by the organization that would eventually become the United States Air Force. World War I had stimulated many to explore the possibility of true vertical flight. None had solved the riddle of stability, but the potential of vertical lift machines for military purposes continued to interest many.

Among these were a few officers of the Army Air Service who had become intrigued with the writings of a Russian with a French name: Dr. George de Bothezat. De Bothezat, a scientist who had fled the Bolshevik Revolution, was a big, bearded man with a quick wit and a violent temper. He was also an extreme egotist who once boasted publicly, "I am the world's greatest mathematician and scientist."

In Russia, de Bothezat had gained international renown for his theories about vertical flight. He had earned degrees in five countries and had published two acclaimed theses: "General Theory of Blade Screws" and "Theory of Helicopter Stability." Both found their way to the library of the Air Service Engineering Division at McCook Field, near Dayton, Ohio.

In the early 1920s, McCook Field was the Air Service's engineering and flight test center. Workers investigated, researched, and developed any idea that might prove useful to the nation's young air arm. Maj. Thurman H. Bane, chief of the Division, read de Bothezat's treatises and felt that the theories had merit. He asked his superiors for permission to contact de Bothezat and invite him to Dayton. Permission was granted, and the Russian emigre was delighted to accept.

Throughout much of 1921 and 1922, the project was shrouded in secrecy, but on December 18,1922, Dr. George de Bothezat's assistants rolled out the "Flying Octopus" for its first test at McCook Field, near Dayton, Ohio, observed closely by de Bothezat (at left, in dark suit) and curious onlookers in and on top of the experimental craft's hangar.

After de Bothezat arrived in Dayton, Maj. Gen. Mason Patrick, Chief of the Air Service, authorized a contract with him, without open bidding, for the construction of a helicopter. This unusual procedure was authorized because no other qualified bidders existed. However, de Bothezat first had to produce a written proposal to make the transaction legal.

Putting It on Paper

De Bothezat was exasperated by this bit of Army red tape, but he nevertheless submitted an eighteen-page letter. "The helicopter here disclosed," it stated, "is. . . to possess all qualities of inherent stability and maneuverability which are essential for the navigation of any vehicle of locomotion. The helicopter considered is essentially composed of four lifting blade screws identical in size and shape and disposed cross-wise."

The letter, accompanied by drawings and diagrams, further described the principles of operation and structure of the craft. General Patrick was impressed. In the 1921 budget, Congress appropriated the astonishing sum of $200,000 for work on the project. De Bothezat was hired as acting chief of the Engineering Division's Special Research Section at an annual salary of $10,000. The government specified that de Bothezat was to produce "drawings and data to design, construct, and supervise flight tests of a helicopter." In turn, the government was to provide engineering assistants, materials, equipment, arid hangar space.

When the Engineering Division received the first set of drawings and computations from de Bothezat, he was to receive $5,000. When the machine was fully constructed, he would receive another $4,800. If it actually left the ground, climbed to 300 feet, and returned to its takeoff point without mishap, he would receive further payments totaling $20,000. The craft was to be ready for flight by January 1, 1922--that is, in seven months.

To keep the curious away and allow de Bothezat and his assistants to work unmolested, the project was given "top secret" status. Work began in a tin-roofed hangar. When the machine began to take shape and outgrew the hangar, a wall of canvas was erected outside to enclose it from view.

Engineers assigned to work with de Bothezat enjoyed the task, despite the Russian's angry outbursts when things didn't go his way. He hovered over their workbenches, watching them turn his drawings into strangely shaped pieces of metal. He spent his waking hours tinkering, figuring, and writing furiously.

The existence of a top secret project right under their noses caused curious McCook test pilots to try to sneak a look at "the thing." Some took to the air to spy on the "mad scientist." At the end of routine test flights, they would swoop low and marvel at the crazy collection of tubing and blades. De Bothezat would shout curses in Russian and shake his fists, but the pilots merely waved back. Several VIPs were allowed to view the machine, however. These included former Secretary of War Newton D. Baker, Secretary of Commerce Herbert Hoover, and Brig. Gen. Billy Mitchell.

Toward the end of 1921, de Bothezat realized he could not meet the deadline and pleaded for more time. He got an extension, and he and his assistants worked through the winter, spring, and summer, inching toward the day of reckoning. By the fall of 1922, the Air Service's first helicopter was near completion. On December 18, 1922, the machine was ready for the world to see.

Spectators quickly gathered around McCook Field as word of the aircraft spread. It had snowed the day before, but it was now sunny, with virtually no wind. Just after 9:00 a.m., the canvas walls parted, and de Bothezat's crew pushed their pride and joy to the center of the field.

Airborne Octopus

Several spectators gasped, snickered, and then broke into loud guffaws. They saw a strange framework of tubes and wires built into the shape of a giant cross, hung together with a spidery network of pulleys, chains, and metal strands. Four giant, six-bladed rotors were mounted on each end of the cross, and four other fans served as stabilizers. To an onlooker, the machine was a nightmare of steel and aluminum tubing, complicated gears, and guy wires.

It was immediately dubbed "The Flying Octopus."

Thurman Bane (by then a colonel) had decided that he would serve as test pilot on the first flight. Taking his place in the pilot's seat, he slowly primed the engine. and started it. The huge contraption started to vibrate as the four giant rotors began to turn slowly like

horizontal windmills.

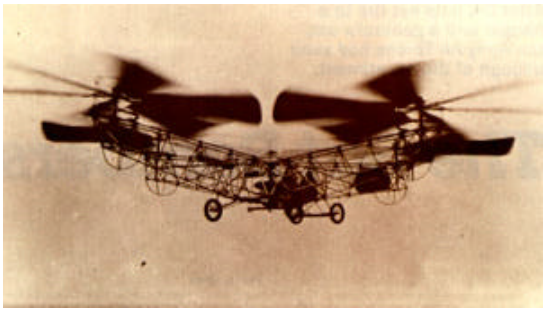
As Bane opened throttle, de Bothezat and his crew stood clear. According to one McCook Field observer, "the movement seemed graceful and there was no noise of friction in any part of the machine. The craft began to lift itself a little--an inch, two, three--until it was about three feet above ground. It hovered at an altitude of two to six feet for one minute and forty-two seconds. Hovering at this height, the helicopter drifted some 300 feet with the wind. Having drifted close to a fence, [Colonel] Bane made a quick landing, which was done under complete control."

The powerplant in the "Octopus" was a 180-horsepower Le Rhone engine, later replaced by a 220-horsepower British Bentley Rotary, which rotated in a horizontal plane directly in front of the pilot's lap. Brig. Gen. Harold R. Harris, one of the helicopter's test pilots, once observed that "the Bentley Rotary was a good engine except that it had a bad habit of throwing cylinders. Fortunately, it never threw one while the tests were underway."

The controls were similar to those of the day's fixed-wing aircraft. A stick and rudder pedals controlled the pitch of the main blades, and an automobile-style steerwheel controlled the pitch of the three-bladed rotors mounted above the engine. A small hand throttle controlled the engine speed. There were so many gears, idles, and wheels to operate, said one test pilot, that not only looks like an octopus, it takes an octopus to fly it "

For example, the test pilot noted, "if the engine failed, the pilot had to reach forward to release the stop on the overall pitch wheel [and] grasp another wheel to adjust the pitch of the center stabilizing propellers so he could slow down the windmilling blades. At the same time, the pilot had to maintain lateral, longitudinal, and directional control with the stick. If he could do all this as he was falling, a fast twist was still needed on the main pitch control at the last minute to soften the landing."

General Harris recalled that "balancing the de Bothezat job. . . was really a tightrope walk in four directions."



The Flying Octopus accomplished all of its initial test objectives. In 1923, it carried increasingly heavier payloads and set an endurance record of two minutes and forty-five seconds. Nevertheless, the project was canceled when structural changes specified by the Army Air Service produced no substantial improvements in the aircraft's performance.

Weird, but Workable

Weird as the de Bothezat contraption looked, it made over 100 flights and accomplished all of its initial test objectives. On January 23, 1923, it left the ground with two people aboard and lifted a payload of 450 pounds to a height of four feet. The next month, it set an endurance record of two minutes and forty-five seconds. In April 1923, it lifted four men off the ground.

In the late spring of 1923, the government contracted with de Bothezat for an improved version of the helicopter The Air Service specified that he had to redesign the central part of the machine to give it strength and reduce size of the main rotors and make them less flexible. The changes, however, produced no substantial improvements in the aircraft's performance. Reluctantly, General Patrick ordered the project canceled.

In a long letter, Colonel Bane praised de Bothezat. "It is my sincere belief," said the officer, "that your helicopter is the biggest aeronautical achievement since the first flight of the Wright brothers." No less a personage than Thomas A. Edison, who had experimented with helicopters in the 1880s, told the Russian, "You certainly have made a great advance; in fact, as far as I know, the first successful helicopter. "

De Bothezat was keenly disappointed by the cancellation but went on to other projects. In 1936, he built another experimental model, which did not show marked improvement over the earlier version. Even so, he appeared before the House Military Affairs Committee that year to advocate continued helicopter research. He predicted that the chopper "would give rise to an entirely new method of warfare, battalions of swift and silently flying machine guns, able to land at night behind [an] enemy's lines."

On February 1, 1940, de Bothezat died in Boston following an emergency operation. He was fifty-eight. Long before then, de Bothezat's "Flying Octopus" had been sent to the McCook salvage yard. However, one rotor hub and four main blades have been preserved and are in the National Air and Space Museum's collection in Washington, D. C.

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