Octave Chanute: Pioneer Glider and Father of the Science of Aviation

By Frank F. Fowle

We are meeting on this historic ground this afternoon with a dual purpose, to honor the genius of a great engineer, and to mark the location where his pioneer experiments with gliders commenced an epoch in the science and art of aviation in America. Octave Chanute was an engineer of the old school, long since passed, who entered the profession many years before it was possible to obtain any systematic education for it, and who acquired his technical training through experience, study and self-improvement. It seems therefore all the more remarkable that he achieved national distinction as an engineer in three different fields within his profession, all prior to becoming seriously interested in aviation, which brought him his greatest honors and lasting fame.

Chanute was born in 1832, a native of France, and came to his adopted country at the age of six, when his father accepted the post of vice-president of Jefferson College in Louisiana. In 1844 they removed to New York City, where Chanute completed his common-school education, and, to use his own expression, became thoroughly Americanized.

In 1849, at the age of seventeen, he entered railroad engineering with the Hudson River Railroad and remained until the line was completed to Albany. Coming west in 1853, he was successively in responsible engineering positions with the Chicago & Alton, the Toledo, Peoria & Western, the Pittsburgh, the Fort Wayne & Chicago, the Ohio & Mississippi, the Kansas, Fort Scott & Memphis, and the southern Kansas division of the Atchison, Topeka & Santa Fe railroads. In 1867 he also designed and supervised construction of the Chicago Union Stock Yards and in 1871 the Union Stock Yards of Kansas City. Chanute's ability as an engineer extended in many directions, but one of his most remarkable early feats was the design and construction of the Kansas City bridge in 1867-69, which was the pioneer structure built across the

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1 This brief address was given at Gary, Indiana, on Saturday P.M., July 11, 1936. The occasion was the dedication of a bronze tablet marker to Octave Chanute, at the site of his experiments with gliders in 1896 and 1897. The ceremonies were held in Marquette Park.
Missouri river. A well-known book describing this bridge was published by Chanute and Morrison in 1870.

Returning east in 1873 he served for ten years as Chief Engineer of the Erie Railroad through the period of reconstruction. During this time he was also chairman of an engineering committee which reported on the need for urban rapid transit in New York City and their recommendations culminated in the construction of the four original lines of elevated railroads, which are still in service today. In 1883 Chanute returned to Kansas City and became a consultant in bridge design. In particular he had charge of design and construction of iron bridges for the Chicago, Burlington & Northern, and the Atchison, Topeka & Santa Fe, including the bridging of both the Missouri and the Mississippi.

Still another pioneer field in which Chanute left his mark was that of the preservative treatment of timber. For five years, from 1880 to 1885, he was chairman of a committee of the American Society of Civil Engineers, which prepared a report that was regarded as authoritative for many years. In consequence he was requested by several railroads, in 1885, to build plants for treating timber. This led to his becoming interested in timber treatment as a business, which continued as long as he lived.

At an age when many successful men think of retiring, Chanute turned his attention to the subject which had always fascinated him most, the problem of aerial navigation in heavier-than-air machines. With that untiring industry and patience of which genius is largely constituted, he attacked the problem by preparing an exhaustive summary of scientific

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*Octave Chanute (chief engineer) and George Morrison (assistant engineer), The Kansas City Bridge (New York, 1870).


Further information was obtained from the following references: A. M. Herring, “Recent Advances toward a Solution of the Problem of the Century,” in The Aeronautical Annual, 1897, No. 8, 54-74; Wilbur Wright, “Experiments and Observations in Sailing Flight,” in Journal of the Western Society of Engineers (Aug., 1903), VIII. No. 4, 490-477; Wilbur Wright, “Some Aeronautical Experiments,” in ibid. (Dec., 1900), VI. No. 4, 488-486; W. J. Jackman and Thomas A. Russell, Flying Machines: Construction and Operation (Chicago, 1910).
knowledge on the subject, and published it. This first appeared in a series of twenty-seven articles in The Railroad and Engineering Journal, commencing in 1891, and then in book form, in 1894, under the title Progress in Flying Machines. Just before this book went to press, Chanute received a copy of Otto Lilienthal’s paper on “The Flying Man”, describing the latter’s experiments with gliders in Germany in 1893, which he then added as an appendix with the comment that Lilienthal’s paper “so fully sustains the views set forth in this book, and holds out such promise of success in the near future, that it has been decided, at some inconvenience, to include a translation of this paper in an extra appendix.” The unselfish enthusiasm and scientific attitude displayed by Chanute are obvious from these simple words just quoted.

In these early writings he said there were ten fundamental problems which must be solved as a pre-requisite to the establishment of successful artificial flight. The most important of these ten, he declared, was the maintenance of equilibrium in the air, because until this was established there would be no advantage in mastering the other nine. He also emphasized the inherent limitations on theoretical analysis and experimentation with models, urging the importance of commencing experimental flights with a full-sized machine carrying a pilot or navigator.

Having made Chicago his permanent home some years earlier, Chanute next prepared to make experimental flights in gliders and selected for this purpose a location among the dunes on the south shore of Lake Michigan, substantially north of Miller’s Station, which was then an isolated spot. Commencing his experiments in the summer of 1896 with a replica of Lilienthal’s glider, he soon concluded that this was inherently a defective and unsafe machine. This conclusion was tragically confirmed by the fatal accident sustained by Lilienthal in one of his glider experiments a few weeks later.

Next he conducted a long series of experiments with multi-plane machines, ingeniously devised to permit many different combinations of wing surfaces and controls. By this process of experimentation, continued through the summer of 1897, he and his assistants finally evolved the biplane constructed on the principle of the Pratt truss, which later was adopted by the Wright brothers in their historic flights at
Kitty Hawk and Kill Devil Hill on the sea-coast of North Carolina. These glider experiments reached the rather amazing total of about 2,000 flights. They were naturally rather short, both in distance and duration, but Chanute was justly proud of the fact that no accident occurred in all this work, save a rip in the seat of his son’s trousers.

Meanwhile Chanute published the results of his experiments in various periodicals, but notably in historic papers contributed to the Journal of the Western Society of Engineers and to the Aeronautical Annual. He was consulted by Wilbur Wright in 1900 and placed all of his researches at Wright's disposal. Moreover he made a trip to North Carolina to observe the glider flights made there by Wilbur and Orville Wright and generously assisted them in every way. He was the means also of securing two addresses by Wilbur Wright before the Western Society of Engineers, the first in 1901 and the second in 1903.

Chanute not only had the intense satisfaction of having his own work bear ultimate fruit in the first successful flight of a power-driven plane, made by Orville Wright on December 17, 1903, at Kitty Hawk, but he lived on to witness the remarkable progress achieved in the succeeding seven years. He followed this development most keenly and was, perhaps, the outstanding authority in America. Only a year before his death he presented a comprehensive paper on “Recent Progress in Aviation” before the Western Society of Engineers, accompanied by a chronology of aviation from 1903 to 1909 inclusive.4

Many honors came to Chanute in the last years of his life. Lack of time forbids any attempt to enumerate them or even to characterize the many fine tributes paid to him after his death on November 23, 1910. Professional memoirs of his life were published in 1911 in both the Journal of the Western Society of Engineers and the Transactions of the

4It seems to me that the three great pioneers who founded the science and art of aviation in America were Langley, Chanute and Wright. Langley founded the modern science of aerodynamics by investigating the mechanical resistance and supporting power of air, with respect to heavier-than-air vehicles in flight. Chanute first experimented with model gliders, some of which are still preserved in the Museum of Science and Industry. However, he soon abandoned these, in favor of full-size gliders carrying a navigator. His great contribution was the development of the bi-plane. The Wrights then took Chanute's bi-plane, added wing controls, steering mechanism and an adequately powerful motor, which resulted in the first successful flight.
American Society of Civil Engineers. He joined the Western Society in 1869, the year of its organization, was its President in 1901, and was elected an Honorary Member in 1909.

In conclusion it seems appropriate to say that Octave Chanute belongs to that distinguished company of scientists, inventors and engineers who have created in America the highest civilization known in all history, have given it the highest standard of living on the globe, and made it the best country in the world in which to live and work.

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