

# AN INTRODUCTION *to Soaring*

by Robert M. Stanley

*The following is the introduction to a lengthy article on soaring written by Robert M. Stanley for the National Aeronautics Council. They have kindly granted permission to The Soaring Society to reprint this article in its entirety. The entire article will be reprinted serially in the subsequent issues of SOARING. Editor.*



The art of soaring provides man his closest approach to the effortless rhythm, the eternal grace and beauty of bird flight. To experience this exhilarating form of silent flight is to awaken that fundamental, though long dormant reverence which we by instinct reserve for the things that fly. Few who have gained thus an apparently unaided master over gravity's immutable laws can fail to heed the stimulating sense of exaltation which such a Magic Carpet-like escape from earthbound existence can evoke.

Long before the airplane came the glider. Flight's basic principles were established through planned, systematic and scientific investigations conducted in gliders. The strength of the human body, inadequate to perform the wing-flapping flight of the birds, was employed in the fabrication and control of machinery having rigid wings whose form has with time assumed more and more the shape of the great soaring birds.

What obscure individual first successfully flew is shrouded in the mists of antiquity. It seems hardly credible that with the materials at hand for centuries, not once should man have actually flown. Mythology, which historians assure has a basis in fact, is replete with legendary heroes who for a time defied gravity with many bizarre forms of wings. Later, during the Middle Ages we find from fragmentary records that more than one heretic paid with his life for his temerity in challenging gravity with home-spun wings. The great Leonardo da Vinci is known to have conducted some eminently successful gliding experiments in which gliders quite similar to Lilienthal's later models were used to carry live passengers down from high launching towers.

Confining ourselves, however, to the past century, we must logically begin with Sir George Cayley, whose brilliant application of mathematical and scientific methods to the problems of flight paved the way for later, more tangible experiments of others. In the 1850's, he built and flew many small gliders, and could doubtless have built successful man-carrying gliders had he not been so intent on first perfecting a steam-driven propulsive unit to sustain flight. His contemporary, Captain LeBris, a French sailor, actually built a large man-carrying kite after Cayley's general pattern, and made several short glides in it.

Best known, however, of all early experimenters, and justly called the father of flight, is Otto Lilienthal. His classic experiments, begun in the 1860's, delved deeply into the fundamental principles of aerodynamic sustenta-

tion. Though he spent years studying many different birds, he had the imagination and judgment to modify his data to fit the human anatomy and its limitations. Training himself as an acrobat, he became sufficiently agile to successfully fly new experimental craft which would have proven disastrous to a less accomplished gymnast. He early discovered the value of cambered wings, and the correct proportions necessary for successful balance. All his gliders were hang gliders, consisting of very lightly constructed wings from which the pilot hung by his arms, launching himself by running down a slope against which a brisk wind was blowing, and balancing himself by shifting his body. By modern standards, hang gliders are considered very hazardous, yet his skillful pilotage completed over 2,000 successful flights during the course of his experiments.

An American contemporary of Lilienthal's, Octave Chanute, who at the advanced age of 65 built and flew several advanced types of craft, contributed materially to the controllability and inherent stability of aircraft. Lacking the nimble physical attributes of Lilienthal, he provided his gliders with a control system permitting the body to remain seated in flight, and used a wheeled under-carriage for launching. It was his latest glider design which served as a prototype for the early Wright biplanes.

For three years previous to their first airplane flights, the Wright brothers distinguished themselves by their gliding experiments, gaining thereby the technical knowledge and piloting skill which assured their later successes in the field of aviation. Though the perfection and exploitation of the airplane afforded them scant time to do so, they pursued their studies of gliding flight until 1911, while their records endured until the renaissance of soaring following the World War.

With an engine to sustain flight, it was natural that the motorless aircraft as a means of aeronautical research should be discarded by the serious scientific student of flight to whom it had always been not a sport but a laboratory tool. Dormant for a decade, it was not until the early 1920's that a group of enthusiastic German flyers revived gliding as a sport. Encouraged by the immediate success they had in both gliding and soaring, it was not long before men of brilliance and influence began to subsidize the amazing feats performed by these aircraft without engines. Once started, the sport spread rapidly until soaring is now practiced in every civilized country in the world.

In America, soaring has had a rather sporadic and desultory career. Denied the governmental subsidy it enjoys in other countries, soaring in the United States has had a difficult time competing with the light and popular airplane. Likewise true it is that until recent years, the predominant type of glider seen in America was hardly a creation to inspire mature confidence. Of antiquated broom-stick-and-wire design, and crude construction, these craft so strangely reminiscent of the horseless carriage days were museum pieces not to be confused with our modern sleek, and highly refined sailplanes.