Lesson 9

Human-Powered Flight

An ancient Greek legend tells of Icarus, who, with wings made of feathers and wax, flew too close to the sun. The wax melted and Icarus fell to Earth. This cautionary tale did not deter Paul MacCready. A pioneer in human-powered flight, MacCready believed that humans, like birds, could fly with muscle power alone. His story began in 1959, when a British engineering magnate named Henry Kremer offered a cash prize for the first successful human-powered flight.

The rules of the offer stipulated that the craft had to complete a figure-eight course around two poles. It also had to clear a ten-foot-high obstacle at both the start and finish. The prize, worth 50,000 pounds (about $129,000 at the time), was still unclaimed in 1976, despite numerous attempts. In July of that year, a man named Paul MacCready began designing a craft that might capture the Kremer Prize. MacCready owned a boat-building company that had incurred debts totaling $90,000; he hoped to use the prize money to liquidate his company’s debt. He must also have been motivated by the challenge, since entering such a difficult contest is a quixotic plan for earning money.

The pilot of MacCready’s craft was a 135-pound, twenty-three-year-old amateur cyclist and hang glider pilot named Bryan Allen. As the power source for the human-powered aircraft, Allen would have the onerous task of pedaling with about four times the amount of force needed to pedal a bicycle. The chief constraint in designing the aircraft was to make it as light as possible while retaining strength and rigidity. So MacCready made the wings and cabin surfaces out of Mylar, a thin, light plastic. As a result, the aircraft had a gossamer lightness and fragility, which partially inspired its name, the Gossamer Condor.* Even with a wingspan of ninety-six feet (longer than that of a DC-9 jet airplane), the total weight of the craft was kept to an incredible seventy pounds.

Before attempting to capture the Kremer Prize, Bryan Allen made many preliminary flights. Then, on August 23, 1977, at a small California airfield, he made the official attempt. By 7:30 a.m. the wind had become nothing more than a zephyr, and Allen was given the signal to begin pedaling. The first obstacle was cleared, with feet to spare. The big propeller, connected by a chain to Allen’s pedals, turned so slowly its revolutions could easily be counted. The Gossamer Condor moved forward at a leisurely eleven miles per hour as the onlookers below watched with mounting excitement. The craft then passed easily over the finish-line obstacle and completed the 2,000-yard course in seven and a half minutes. Pandemonium broke loose among the spectators as the Condor gently landed. MacCready had won the Kremer Prize!

* A condor is a very large vulture.
Two weeks later, Henry Kremer announced another prize. He would give 100,000 pounds (about $258,000) for the first successful human-powered flight across the twenty-two-mile-wide English Channel. So on June 12, 1979, Bryan Allen took off from the English coast in the successor to the Condor, the newly designed Gossamer Albatross.** Since a secondary meaning of albatross is “an obstacle to success,” it might seem that MacCready was tempting fate. But it turned out that Albatross was a misnomer because all went well as the frail craft headed for Cap Gris-Nez, France. Accompanied by a flotilla of fifteen small boats filled with spectators, Allen flew the Albatross. But after two and a half hours, and with the French coast in sight, it appeared that the last vestige of Allen’s strength was leaving him, and he feared that the flight would end ignominiously in the sea just yards from the shore. Sheer tenacity kept him pedaling. Spectators in the boats and on shore cheered themselves hoarse as they saw the Albatross come floating above the beach and make a gentle turn. Then, after nearly three hours, Allen stopped pedaling, and the Albatross made a perfect landing on the sand.

** An albatross is a large seabird.

► Answer each question in the form of a sentence. If a question does not contain a word from the lesson, use one in your answer. Use each word only once.

1. Was Kremer a successful businessperson?

2. What quality did MacCready need in order to succeed in his seemingly impractical quest?

3. Why was Mylar used to cover the aircraft’s frame?

4. What constraints were placed on the path and height of the aircraft?

5. How would a zephyr help flying conditions?

6. Why did the name Albatross turn out to be a misnomer?
7. How was Allen **incurring** risk on his flight to France?

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8. Why was Allen’s task considered **onerous**?

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9. Describe the scene on the beach when the *Albatross* landed.

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10. How much of MacCready’s debt did his total winnings allow him to **liquidate**?

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**FUN & FASCINATING FACTS**

• The Latin word *magnus* means “great” and forms the root of many English words. *Magnitude* (Lesson 8) is greatness of size or importance. *Magna Carta* is the great charter granting civil liberties to England, signed by King John in 1215. A *magnanimous* person is one who shows greatness of spirit. To *magnify* something is to make it seem greater than it really is. A *magnificent* display is one marked by the greatness of its splendor. And a *magnate* is a businessperson of great power and wealth.

• The hero of Miguel de Cervantes’ great comic romance, written in Spain in the early 1600s, is Don Quixote, “the knight of the woeful countenance,” whose name is also the title of the book. Don Quixote is totally caught up in the romance of noble deeds, utterly idealistic without a shred of practicality in his makeup. This memorable character is the inspiration for the adjective associated with his name. A *quixotic* endeavor is a noble but unrealistic pursuit.

• The ancient Greeks believed that a multitude of gods existed in nature. One of these was Zephyrus, god of the west wind, which was noted for its gentleness. The name survives in English as *zephyr*, a gentle breeze.