



Eagle: © Jim Zipp / Science Source

The Upturned Wing Tip of Soaring Birds

A JET plane in flight creates rapidly spiraling swirls of air at the tips of its wings. These vortices cause drag, increasing fuel consumption. They also buffet planes that may be following closely. Thus, flights departing from the same runway must be sufficiently spaced to allow time for the vortices to dissipate.

Airplane engineers have discovered a way to reduce these problems. Their solution? Winglets, inspired by the upturned wing-tip feathers of soaring birds, such as buzzards, eagles, and storks.

Consider: During flight, the feathers on the wing tips of those large birds bend upward until they are almost vertical. This configuration balances maximum lift with minimum wing length. It also improves performance. Engineers have designed airplane wings with a similar shape. Using innovative wind-tunnel testing, they found that if the modified wings were precisely

curved at the tip and properly aligned with the airflow, they improved aircraft performance—nowadays by up to 10 percent or more. The reason? Winglets minimize drag by reducing the size of the vortices. Moreover, winglets also create a form of thrust that “counteracts some of the normal drag of the airplane,” says the *Encyclopedia of Flight*.

Winglets thus enable airplanes to fly farther, carry a greater load, have shorter wings—which also facilitates parking—and save fuel. In 2010, for example, airlines “saved 2 billion gallons [7,600 million L] of jet fuel worldwide” and contributed to large reductions in aircraft emissions, says a NASA news release.

What do you think? Did the upturned wing tip of soaring birds come about by evolution? Or was it designed? ■

