**Headline:** The Aerodynamics of Velvet: What Owls Can Teach Humans

**Teaser:** Owl physiology can help advance technology to address noise pollution—and maybe even help the deaf hear.

By Jackie Higgins

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**Book Cover Image:** <https://drive.google.com/drive/folders/17Le8HGvHst52mstkIBS1CoWLHKBPu2jF?usp=sharing>

**[Article Body:]**

To the ancient Greeks, the owl symbolized wisdom, but the Romans saw it as an evil omen. Their myths tell of an owl-like *strix* that stalked the night and preyed on human flesh. Ovid’s poem *Fasti* describes how such a demon slipped into the nursery of the sleeping prince Proca and was found hunched over the cradle, sucking the newborn’s blood. This supernatural owl changed over time. In Italian, *strix* became *strega*, meaning witch; in Romanian, *strigoi* is a vampire; and, in *Macbeth*,Shakespeare once more recast the owl as ‘the fatal bellman’ whose shriek summons King Duncan’s death. Like its legendary counterparts, the great gray owl, *Strix nebulosa*, inhabits the shadows. It lives in the icy north, in the dense, dark conifer forests of Russia, Alaska, and Canada. By night, it hunts. Scythe-like tal­ons and hooked, knife-sharp beak make the great gray owl a fearsome predator. By day, it stays hidden. Although one of the largest of its kind, its dusky and mottled plumage blends with the tree branches to atomize the bird’s silhouette, making it as nebulous and insubstantial as mist. Moreover, on a still moonlit night where snow blankets the landscape and deadens sound, the owl swoops on its quarry and barely breaks the silence.

The quietness of the owl’s flight is unrivaled; its wing beat makes a sound so soft that it is nearly imperceptible. “While we’ve known this for centuries,” [said](https://www.cam.ac.uk/research/news/silent-flights-how-owls-could-help-make-wind-turbines-and-planes-quieter) Professor Nigel Peake of the University of Cam­bridge, “what hasn’t been known is how owls are able to fly in silence.” His laboratory is one of a few around the world trying to learn from this avian acoustic stealth. For years, the focus had been the feathers along the wing’s leading and trailing edges. Those at the front have tiny stiff barbs that point forward like the teeth of a comb, whereas those at the back are flexible and fringed. They work together to break up, then smooth the air currents as they flow over and off the wing, damping down any noisy turbulence. Recently Peake homed in on a third ele­ment: the wing’s luxuriant touch. “We were among the first to think about the aerodynamics of this velvet,” he told me. In 2016, he collabo­rated with scientists in America for a closer look at the smooth surface of wings from various owl species, including the great gray. They saw that the birds’ primary feathers were covered with a millimeter of fine fluff.

“Microscope photographs of the down show it consists of hairs that form a structure similar to that of a forest,” Peake [explained](https://core.ac.uk/download/pdf/77415874.pdf). “The hairs ini­tially rise almost perpendicular to the feather surface but then bend over in the flow direction to form a canopy.” This Lilliputian ‘forest’ reduces pressure fluctuations and turbulence dramatically as the air flows over the wing. The researchers, funded by the U.S. National Science Foundation and the U.S. Office of Naval Research, recreated this topography in plastic. Testing their prototype in a wind tunnel, they found it reduced sound so well that they patented the de­sign. This discovery promises not simply stealthier surveillance aircraft or submarines but also a significant drop in everyday noise pollution from, say, wind turbines, computer fans, and even the passenger planes daily crisscrossing the planet.

“Owls have much to teach us about mak­ing our own world quieter,” said Peake. “No other birds have wings that scatter sound so their prey can’t hear them coming.” The great gray is neither seen nor heard, and this natural specter also seems endowed with a supernatural sense. From a distance of some 30 meters (100 feet), it can pinpoint mice or voles with uncanny precision, even those hidden beneath mounds of virgin snow.

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Scientific research has coaxed the owl from the shadows and restored her to Athene, the Greek goddess of wisdom. Through this creature, we learn what it means to hear: not simply to detect sounds but to create rich and perspectival soundscapes. We discover our talent for discerning whispers of whispers, then locating and layering them to build cathedrals of sound. The silent bird also guides us toward making this world a better place: whether through redesigning technology to subdue unwanted noise or improving the lives of those less fortunate. “I am just as deaf as I am blind,” [wrote](https://www.afb.org/HelenKellerArchive?a=d&d=A-HK02-B229-F02-009) the American deaf-blind activist Helen Keller to her doctor in 1910. “The problems of deafness are deeper and more complex, if not more important, than those of blindness. Deafness is a much worse misfortune.” The owl sits on the shoulder of the blind, bearing the gift of earsight. One day, alongside her wider avian family, she may also offer others the gift of sound.