

Snarge' Happens, and Studying It Makes Your Flight Safer

When a bird collides with an airplane, determining its species can help prevent future collisions. To do that, scientists need snarge.

By Jason Bittel

April 14, 2022

When I wrote about European starlings and their complex North American origin story, I didn't expect readers to be so fascinated by one particular word in the article: snarge. But as the emails, tweets and other feedback poured in, it became clear that this gnarly-sounding six-letter word and the field of scientific inquiry that produced it were worth closer examination.

On Oct. 4, 1960, a Lockheed L-188 Electra airplane nose-dived into Boston Harbor just seconds after takeoff. Out of 72 crew members and passengers, only 10 survived.

As investigators sorted through the rubble, they kept finding globs of what appeared to be black feathers. Such material eventually came to be known as snarge.

Best investigators could surmise, the Electra's engines had ingested a flock of birds, but no one could say what sort of bird could bring down an airplane of that size. So the investigators called Roxie Laybourne, an ornithologist at the Smithsonian Institution who was an expert on feathers.

With a vast collection of museum specimens at her disposal, Ms. Laybourne compared microscopic patterns in the feathers. What wrecked the Electra had not belonged to a large-bodied bird, like a vulture, turkey or crow. Rather, the feathers were from the diminutive European starling.

In the decades after, airports would hire wildlife biologists to take the information Ms. Laybourne provided and use it to discourage certain bird species from flocking around their flight paths. In turn, Ms. Laybourne would become a science and air-traffic safety legend known as the Feather Lady. You'd be just as warranted in calling her the Queen of Snarge.



Starling specimens at the American Museum of Natural History. They've been described as "feathered bullets." Karsten Moran for The New York Times



The tail of a Lockheed L-188 Electra plane that crashed into Boston Harbor was recovered in 1960. Frank C. Curtin/Associated Press

Carla Dove, program manager for the Smithsonian Institution's Feather Identification Lab and Ms. Laybourne's successor, said she wasn't sure who first coined the term snarge, but that she first heard it at the museum.

Snarge can be a wad of a Canada goose lodged inside an airplane engine. Or it can be a broken and burned gull feather littered along the runway. Snarge can even be as small as a rusty-red smear on the nose of an airliner.

But no matter what form it takes, every bit of snarge is different — and all snarge is important.

Back in Ms. Laybourne's day, physical comparison of snarge specimens beneath a microscope was the industry standard.

"She cleaned up the feathers and washed them, and then matched the pattern, the colors and the texture to the museum specimens," Dr. Dove said.

Dr. Dove and her colleagues now also use DNA analysis because a snarge sample may not always include a recognizable piece of feather. In some cases, samples may be too small or degraded to yield DNA, so they solve the mystery with a combination of techniques.

And determining the origin of snarge has real-world consequences. After starlings were implicated in the Electra crash, which remains the deadliest ever caused by a bird strike, the airline industry started making engines with those collisions in mind. Many plane models can now be expected to survive a hit from a bird up to eight pounds.

But even these technological advances don't mean that an aircraft is invulnerable to a bird strike, as Chesley B. Sullenberger III and his passengers learned in 2009 when Canada geese brought down their Airbus A320 in the event now known as the Miracle on the Hudson.

Of course, even small animals can make a deadly impact.

"Starlings have been referred to as feathered bullets," said Richard Dolbeer, science adviser for the Airport Wildlife Hazards program, part of the U.S. Agriculture Department. "They're a dense, chunky little bird, with a higher body density than a lot of other bird species."



Ms. Laybourne, left, and Carla Dove examining a black vulture specimen at the Smithsonian in 1996. Smithsonian Institution Archives



A trap designed to capture birds, including starlings, is parked next to a taxiway at La Guardia Airport. Karsten Moran for The New York Times

Since the 1960s, the Feather Identification Lab has worked with the Federal Aviation Administration and wildlife biologists at every major airport to identify problem birds and discourage them from hanging out nearby.

Management options include capturing and relocating some birds or scaring off others with trained falcons, noise cannons and distress calls. On rare occasions, they turn to lethal measures.

Other strategies include eliminating standing water, removing garbage or food scraps and putting nets over roosting areas.

“Really, we just want to make the airport as uncomfortable to birds as possible,” Dr. Dolbeer said.

Despite these efforts, snarge happens. Wilbur Wright crushed a flock of birds way back in 1905, and in modern times, with more flights in the air than ever, aircraft whack birds every single day. In 2019 alone, the F.A.A. documented 17,358 strikes. The vast majority amount to little or no damage, fortunately.

Perhaps most interesting of all: Snarge is not limited to birds.

Bats and insects turn into snarge. And there are even more curious species that show up, including frogs, turtles, snakes, and even cats and rabbits.

The explanation?

Sometimes a bird of prey will get scared by an approaching airplane and drop whatever it's holding in its talons, which is then sucked into a jet engine. It's also possible that as a bird and an aircraft collide, the contents of the predator's stomach are splattered along with the rest of the bird, and that DNA still shows up in genetic testing, Dr. Dove said.

It's never a dull day when you're in charge of the snarge.