

Pterosaur fossils launch flap over flight

Long before birds made their debut, a group of winged reptiles called pterosaurs took to the skies as the first vertebrates endowed with the power of flight. Over the last two centuries, paleontologists have debated what kind of wings carried these "dragons of the air" and how they managed to take off.

A new analysis of pterosaur fossils from Kazakhstan in central Asia raises questions about the prevailing image depicting pterosaurs launching themselves by running quickly along the ground. Instead, the exquisitely preserved Asian specimens suggest that at least one species had wings that made walking an awkward affair, reports David M. Unwin and Natasha N. Bakhurina of the University of Bristol in England. They describe their research in the Sept. 1 NATURE.

The Asian species bears the name *Sordes pilosus*, or "hairy devil," because parts of its wings had small wavy fibers, which Soviet paleontologists interpreted as fur when they first described the animal in 1971. The pigeon-sized flier dates from the late Jurassic period, roughly 150 million years ago.

Judging from impressions in the rock next to the *Sordes* skeleton, Unwin and Bakhurina conclude that the animal's wings attached along the body from the front limbs to the hind feet, much like

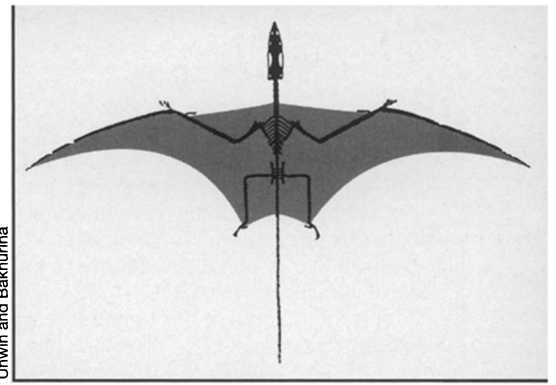
the wings of a bat. They also found evidence of a smaller wing connecting both legs.

When the animal was grounded, "the attachment of [the wing membrane] to the legs and feet must have severely impeded movement," the researchers say. They suggest that *Sordes* took to the air by climbing to some height and then launching itself. With its relatively large wings, *Sordes* would have flown slowly and maneuvered well.

This interpretation of wing design challenges the prevailing theory about pterosaurs, put forward over a decade ago by paleontologist Kevin Padian of the University of California, Berkeley. Padian argued that pterosaurs flew more like birds, with narrow wings attached to the trunk of the animal. With their legs unencumbered, pterosaurs could have run rather than crawled along the ground.

Padian remains convinced that pterosaur wings did not reach back to the hind limbs. He dismisses the conclusions of Unwin and Bakhurina because the specimens of *Sordes* they describe are flattened, making it difficult to distinguish impressions of the wings from squashed parts of the body.

"Unwin has not tested the hypothesis that a lot of what he's seeing is post-mortem damage. It's very hard to tell



Shading shows wings of Jurassic pterosaur from Asia.

what is actually wing," Padian says.

He argues further that the structure of the ankle, knee, and hip joints in pterosaurs precludes them from flying as bats do. They could not have brought their legs up in the same plane as their wings, Padian says.

Finding more specimens, preserved in different positions and various environments, would provide a means of testing whether the wings actually extended to the legs or not.

Unwin and Bakhurina report that seven specimens of *Sordes* exist, but Padian contends that other researchers have not had an opportunity to study the fossils. "Access to these specimens by other investigators has not been granted, so really what anyone says about them is up for grabs," says Padian.

— R. Monastersky

Gene therapy for CF reaches human lungs

This week, researchers reported successfully transferring the normal version of the cystic fibrosis (CF) gene to cells lining the lungs of a CF patient. This is the first step in an approach scientists hope will one day correct the underlying genetic defect causing CF.

"This is very, very important in terms of demonstrating the feasibility of gene transfer for the treatment of cystic fibrosis," comments Robert J. Beall of the Cystic Fibrosis Foundation in Bethesda, Md.

Last October, a team led by Michael J. Welsh of the University of Iowa in Iowa City reported inserting the healthy CF gene into cells lining the nasal passages of three people with cystic fibrosis (SN: 10/23/93, p.260).

To achieve a treatment for CF, researchers had to figure out a way of getting this gene deep into the lungs. Scientists know this respiratory illness results when a mutant gene causes the production of a defective protein. This flawed protein leads to a build-up of damaging mucus in the lungs.

Ronald G. Crystal, former head of the pulmonary branch at the National Heart, Lung, and Blood Institute in Bethesda, Md., and his colleagues have

forged ahead, inserting a healthy version of the CF gene into lung cells.

Crystal, now at the New York Hospital-Cornell Medical Center in New York City, and his coworkers relied on a modified adenovirus to get the healthy version of this gene into four CF patients. Each received a single dose of the therapy in the nose, followed by a single dose in the lungs.

The researchers found that the healthy gene turned on in the nose cells of one patient and in the lung cells of another. They describe their findings in the September NATURE GENETICS.

This preliminary experiment was designed to home in on safety issues. It found no evidence that the crippled adenovirus could replicate and thus cause infection. One patient in the study developed lung inflammation, a complication attributed to a reaction to the modified virus.

This study proves that it's possible to get the healthy gene for CF into the lungs, Beall says. "It's another step along the way," Crystal says, noting that scientists still must show such therapy will ease the symptoms of this disorder. — K. A. Fackelmann

Seniors gain gut protection

Senior citizens who garden may reap more than just a verdant landscape. A new study shows that regular, moderate exercise — such as gardening or walking — can reduce an older person's risk of suffering serious intestinal bleeding.

Compared to middle-age adults, seniors are five times as likely to be hospitalized for gastrointestinal hemorrhage. Jack M. Guralnik of the National Institute on Aging in Bethesda, Md., and his colleagues decided to study the link between exercise and this common condition in the elderly.

The team surveyed 8,205 senior citizens. The study revealed that participants who walked, gardened, or engaged in some other activity at least three times a week slashed their risk of developing a serious intestinal hemorrhage by about 40 percent compared with their less-active peers. The researchers describe their results in the Aug. 24/31 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Guralnik believes the protection conferred by exercise makes sense: Regular exertion may boost blood supply to the gut and thus ward off intestinal damage. — K. A. Fackelmann