

# DRAGONfly

*The largest complete insect wing ever found*



*ropsis* swooped over the swamps, snatching insects from the air and seizing small amphibians. (Were it still extant, it would be a terror to mosquitoes.) The Permian ended abruptly with the greatest mass extinction ever known, perhaps caused by a blow to Earth by a comet or asteroid: 70 percent of all land dwellers were goners, *Meganeuropsis* among them.

**W**HEN Harvard curator of fossil insects Frank M. Carpenter dug up this wing in an Oklahoma prairie in 1940, he held a piece of the first evidence that insects had once been gigantic. The wing belonged to an ancestral dragonfly, *Meganeuropsis americana*, with a wingspan of almost two and a half feet.

This formidable creature lived during the Permian period, from 290 million to 248 million years ago, before birds existed, even before dinosaurs, when amphibians were the dominant life form. Parts of Oklahoma and Kansas were a tropical coastal wetland, alternately brackish and then fresh as the epeiric sea withdrew. *Meganeu-*

Perched on the fossil wing, for a spot of color and to provide scale, are modern-day descendants known as Blue Darners or Southern Hawkers (*Aeshna cyanea*). Like others of their kin, they spent their larval stage in water, eating whatever they could get their mouths on. As adults, they could beat their two uncoupled pairs of wings independently, an ability that makes the dragonfly a marvel of flight engineering and a master of the air. It can pursue insect prey at high speeds (35 miles per hour or more, in some species). It can change course 180 degrees in a flash. It can hover.

The respiratory biology of the dragonfly, the way it diffuses oxygen through its body, puts an upper limit on body size, a

limit *Meganeuropsis* appears to have ignored. A controversial theory scientists have proposed is that the Permian atmosphere must have been richer in oxygen than ours for this giant to fly; it could not have negotiated today's thin air. This wing is at rest on permanent exhibit at Harvard's Museum of Natural History.

*Meganeuropsis* is alive and earning a living in popular culture. In the BBC's *Walking with Monsters*, for example, it steals a reptile from an oversize spider (see [www.harvardmagazine.com](http://www.harvardmagazine.com)). In the 1958 movie *Monster on the Campus*, when Professor Donald Blake irradiates a coelacanth, a modern dragonfly exposed to its fluids devolves into *Meganeuropsis* and the professor into a murderous Neanderthal. ♣

**According to Nancy Pick in *The Rarest of the Rare*, a book about Harvard's natural history museum, Frank Carpenter and a colleague, in just 10 weeks in the summer of 1940, collected more than 5,000 fossil insects in Noble County, Oklahoma, including this one. The modern dragonflies have wingspans of about four inches; the wings of the largest of today's dragonflies measure roughly six inches across.**