Lucy boasts reflexes of a mouse

Surprising discovery may help treat neurological disorders in large animals

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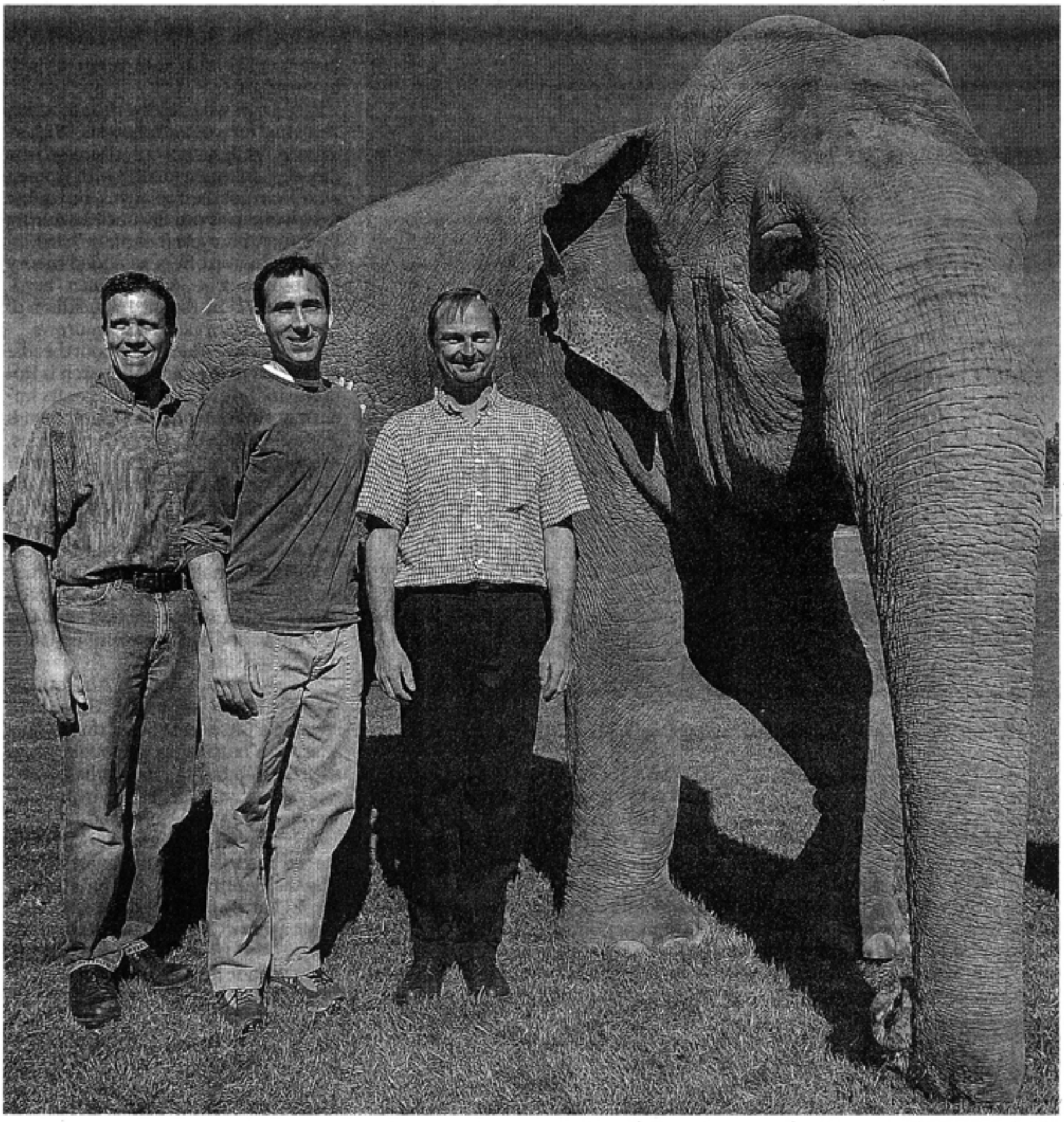

JOHN LUCAS, THE JOURNAL

Researchers, from left, Doug Weber, Maxwell Donelan and Dave Collins tested Lucy the elephant's reflexes to see why she moves so slowly.

Ever wonder why elephants move so slowly?

Scientists turned Lucy the elephant into a guinea pig this week to discover why.

While Edmonton Valley Zoo's oldest, largest and most popular resident scarfed down sugar cane and watermelons whole, researchers recorded Lucy's reflexes by putting electrodes on her skin, then stimulating the nerve to her leg muscles by sending an electrical current through an acupuncture needle attached to the back of her knee.

The reaction time of an animal tripping over a rock depends on the speed of its nerves and how far the nerves travel.

The researchers from Simon Fraser University and the University of Alberta expected elephant nerves would be fast because their legs are so long.

What they found surprised them.

Even though nerve impulses have 50 times farther to go in a four-tonne animal like Lucy, her nerve speed is only slightly faster than a mouse's.

Therefore, relative to her body size, Lucy's reflexes are very slow. The scientists say this presents an interesting mystery. If the neural impulses in elephants take so long to travel from the leg to the spinal cord and back down the leg, why do the animals recover when they trip? Why don't they fall down?

Nobody's sure, says Maxwell Donelan, director of Simon Fraser's locomotion laboratory in the school of kinesiology, but it could explain why elephants move as slowly as they do.

More importantly, the findings could eventually help veterinarians and zoos to care for large animals with neurological disorders. "Similar measurements have been done in humans to diagnose illnesses such as multiple sclerosis and carpal tunnel syndrome, but never in elephants," said Donelan. "Understanding their neurological dysfunctions could help when they get sick."

Although Donelan says it's hard to be conclusive after studying only one elephant, he suspects the results would be similar when more of them are studied.

At that point, the scientists plan to submit their findings for publication. They would also like to repeat the experiment on a giraffe.

"The longer the animal's legs, the better," he said. While Lucy's easy-going nature and maturity (she's 30) allowed researchers to poke and prod her for an hour, using the zoo's other elephant, 15-year-old Samantha, was out of the question. "We call teenaged elephants like Samantha 'punks,' which describes her personality pretty well," said head zookeeper Dean Treichel. "She's much too boisterous to stay still for a whole hour."

Donelan said the study could also shed light on the movement constraints of dinosaurs. "Movies like *Jurassic Park* show dinosaurs running as fast as a jeep.

"But this finding of relatively slow reflexes in large animals suggests they'd be a lot slower."

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