The Horse's Leg

A HORSE (*Equus caballus*) can gallop at a speed of up to 30 miles per hour (50 km/h). Although this involves considerable mechanical work, relatively little energy is spent. How is this possible? The secret is in the horse's legs.

Consider what occurs when a horse gallops. Elastic muscle-tendon units absorb energy when the leg steps onto the ground, and much like a spring, they return it, propelling the horse forward.

Furthermore, at a gallop the horse's legs vibrate at high frequencies that could injure its tendons. However, the muscles in the legs act as dampers. Researchers call this structure a "highly specialized muscle-tendon design" that provides both agility and strength.

Engineers are trying to imitate the design of the horse's legs for use in four-legged robots. However, according to the Biomimetic Robotics Laboratory of the Massachusetts Institute of Technology, the complexity of this design cannot be easily duplicated with current materials and engineering knowledge.

What do you think? Did the structure of the horse's legs come about by evolution? Or was it designed? ■