

THESE LEGS ARE MADE FOR DRIVING

Five eclectic visionaries imagine an alternate reality where cars walk, fly, and drive themselves.

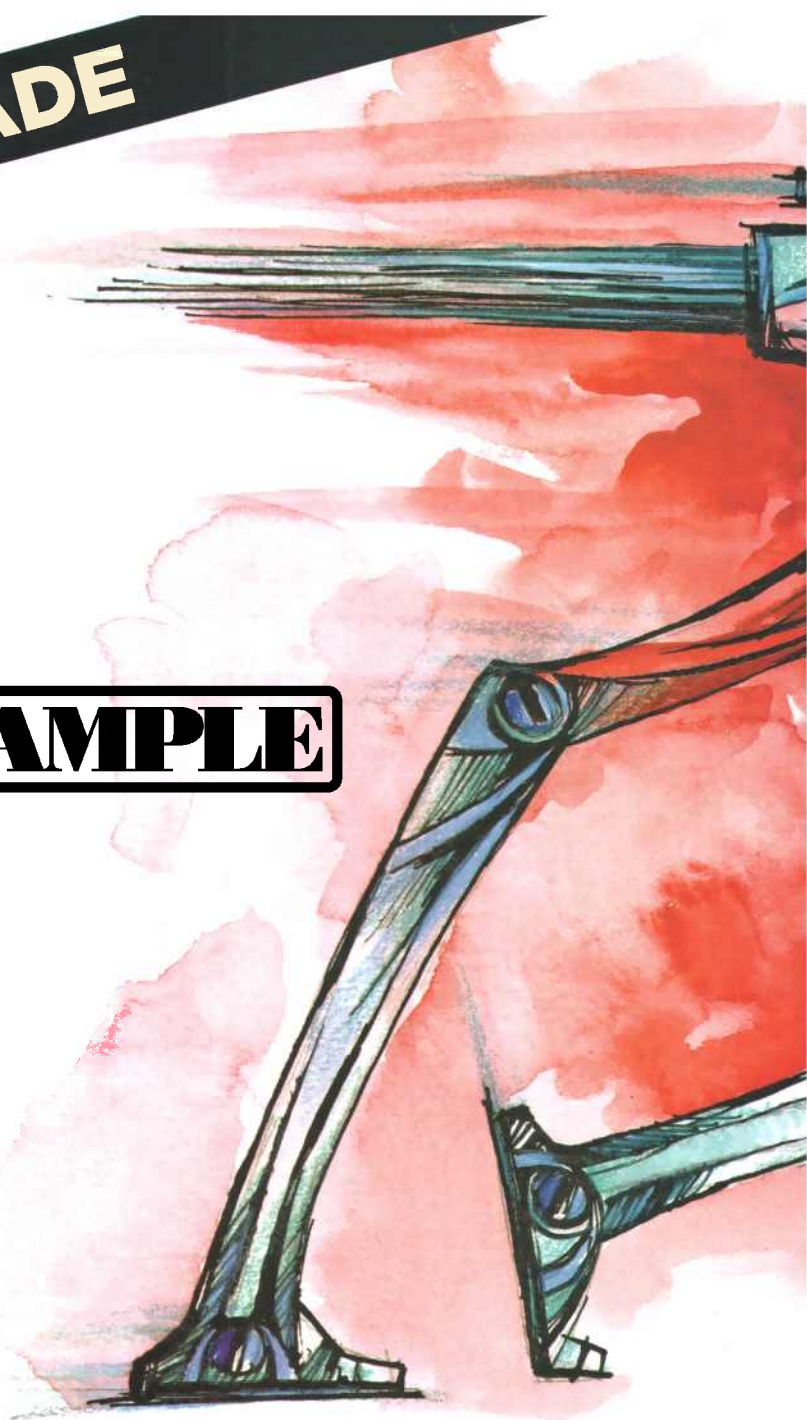
BY DANIEL H. WILSON

SAMPLE

Automobiles have played a huge part in American history, but the rise of the gasoline-powered horseless carriage was not preordained. Cars as we know them evolved in response to a specific set of circumstances. Given the proper impetus, they might easily—radically—evolve again.

By the turn of the 20th century, inventors had built engines run by steam and electricity as well as gas. Each had crippling drawbacks. Steam-powered cars took a long time to fire up; electric cars were slow and couldn't go far on a battery charge; and gasoline-powered cars were dirty and required tedious hand-cranking. With every product equally bad, market dominance became a matter of affordability. When Henry Ford introduced the Model T in 1908, he made gasoline cars so cheap that they beat out the competition.

A century later, we may be at another turning point, ready for something safer, faster, less intrusive, and more economical. If we were to begin again, what would leading thinkers outside the auto industry, unburdened by tradition, come up with?





SAMPLE

JAMES KUFFNER DARES TO ASK. "WHY WHEELS?"

How does one reinvent the wheel? Replace it with legs. A two-legged car may sound far-out, but James Kuffner has authored dozens of scientific papers that suggest such a scenario could be reality. Kuffner is head of the Planning and Autonomy Lab at the Robotics Institute of Carnegie Mellon University and a frequent collaborator with car companies such as Toyota.

In theory, cars with legs could travel anywhere humans can walk, hike, or climb. Liberated from the wheel, autos would have no need for expensive, tar-covered roads, nor for many bridges or tunnels. Instead, dirt highways would teem with mechanical foot traffic leaping like fleas between concrete landing pads.

Practically speaking, legs beat wheels only in certain domains.

Humans have spent thousands of years building roads because wheels are so cost-effective. "Legs will never be as energy efficient as wheels," Kuffner says, "and I doubt that they'll be as high-speed." That's one reason Kuffner's current research focus is on smart cars with sensors. But in rough terrain, like a dense rain forest or uncharted wilderness, legs could have the edge.

Kuffner is leading one of six teams of robotics researchers to teach a four-legged robot called LittleDog (built by Boston Dynamics) how to walk over unpredictable terrain. LittleDog's elder sibling, BigDog, is a gas-powered test mule already hauling 340 pounds up and down snow-covered hills. Make these robots a bit bigger, add space for passengers and onboard controls, and you could have an ambulating automobile.

