briefings

Engineering Feat

The Sundial Bridge at Turtle Bay opened July 4 in Redding, Calif. It is Spanish engineer-architect Santiago Calatrava’s second completed work in this country. The bridge took 10 years and $23.8 million to complete.

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INNOVATION

G.I. JOE GOES ROBO
The art of miniaturization and the advent of increasingly lightweight materials notwithstanding, soldiers in the field are still required to lug heavy loads on their back. The Defense Advanced Research Projects Agency (DARPA) has long been interested in exoskeletons that could help soldiers carry more weight without extra effort. Now researchers at the University of California-Berkeley’s Robotics and Human Engineering Laboratory have devised prototypes of a self-powered exoskeleton that show great promise. The BLEEX (Berkeley Lower Extremity Exoskeleton) allows a wearer to carry a 70-pound backpack with ease. BLEEX consists of two leg braces that strap onto combat boots; the backpack connects to the braces at hip level. A small engine (one version uses gasoline as fuel) provides power to the computer and hydraulic system. A local area network processes data from 40 sensors and operates hydraulic actuators to keep the device in step with the wearer. Latest versions allow a BLEEX pilot to walk, squat, bend, and climb stairs. Eventually, says Homayoon Kazerooni, the mechanical engineering professor who oversees the lab, running and jumping will be possible. Though Kazerooni says a gasoline-run exoskeleton is no more dangerous than a jeep, he’s not satisfied that gasoline should be the fuel of choice. “We’re experimenting with all kinds of power supplies.” Except, of course, the human kind. —Thomas K. Grose