

## The road to intelligent weigh stations

The proposed Intelligent Vehicle-Highway System (SN: 3/21/92, p.184) paints a futuristic picture of ultra-efficient transportation, including roads capable of automatically weighing trucks as they rumble along. Already, researchers at Oak Ridge (Tenn.) National Laboratory have developed a portable "scale" that could smarten up the highway.

The new device determines a vehicle's weight by measuring how much light passes through an optical fiber — made of pliable silicone rubber and housed in protective materials — placed on the road. A heavy truck deforms the sensor more than a car does, so that less light passes through. A detector converts the light signal to an electric signal, which feeds into a roadside computer. The computer analyzes the information and reports the weight borne at each axle as well as that of the entire vehicle. With sensors placed in an N-shaped configuration, the device can even measure a vehicle's "footprint" to determine its speed, says principal investigator Jeffrey Muhs.

Unlike the conventional weigh station, the new system does not interrupt traffic flow and moves easily from one location to another, says Muhs. However, road quality does affect its margin of error, which is 1 to 3 percent under optimum conditions. "If you put the device on a gravel road, you're not going to get nearly as accurate a result as you would on a nice, smooth concrete or asphalt road," he notes.

International Road Dynamics, a company based in Saskatoon, Saskatchewan, plans to begin manufacturing the device in the town of Oak Ridge. Within a year the firm expects to use the sensors to collect data about traffic flow, says Muhs. Then it hopes to use the sensors in a low-cost weigh station that will identify vehicles with weights near the legal limit. The screen-

ing system, hooked up to a roadside message board, would allow lightweights to cruise but would signal for overloaded trucks to pull over.

## Rich music from a hardware-store bow?

William Hayden, professor of violin at the University of South Florida in Tampa, wanted to make a better bow — one that beginning students could fiddle with and not break and that wouldn't cost hundreds of dollars. He took a low-tech approach to the problem.

"I went into Ace Hardware, collected parts to assemble, spent a few days creating prototypes, put them to my violin, and started playing — and I couldn't believe it," says Hayden. His instrument took on a brilliant and resonant tone when he first used the new bow last October, he says.

The cost of materials totaled only \$6.50, but when Hayden used the new bow at the university recital hall, his colleagues preferred it over his usual \$1,300 bow, he says. "Now I play exclusively on my own hardware creation."

A traditional bow is made of a rod of Brazilian pernambuco wood. Stretched between the ends are horsehairs, which wear out about every two months. Hayden's new bow replaces the wood with metal and the hairs with synthetic monofilaments treated with a special chemical preparation.

The bow is "practically indestructible," and schoolchildren who have tried it are already anxious to use it, he says. Two companies have expressed interest in licensing and marketing the bow. But Hayden says he first wants to try other metals and some high-tech options as he works with an industrial engineer to refine the design.

## Books

**Books** is an editorial service for readers' information. To order any book listed or any U.S. book in print, please remit retail price, plus \$2.00 postage and handling charge for each book, to **Science News Books**, 1719 N St., N.W., Washington, DC 20036. To place Visa or MasterCard orders, call 1-800-544-4565. All books sent postpaid. Domestic orders only. Please allow 4-6 weeks for delivery.

**Dogs: The Visual Guide to Over 300 Dog Breeds From Around the World** — David Alderton. Each entry in this comprehensive guide features several illustrations, including a full-color photograph, an illustration of the dog's height in relation to a 6-foot-tall man, and color swatches of the dog's fur. Breed descriptions detail the dog's country of origin, history, first use, temperament, full-grown weight, and other pertinent facts. An excellent guide for choosing a dog and learning about different breeds. Dorling Kindersley, 1993, 304 p., color photos, paperback, \$17.95.

**Hannah's Heirs: The Quest for the Genetic Origins of Alzheimer's Disease** — Daniel A. Pollen. The author, a neurologist, obtained in 1985 a pedigree tracing five generations of a family in which many members suffered from Alzheimer's disease. This pedigree, including medical records, proved to be the most complete known documentation of an inherited tendency to develop Alzheimer's. Pollen recounts here his work with members of this family and with genetic researchers who are searching for the precise DNA link. He also examines the history of such research, offering the reader a better understanding of the work and findings. Oxford U Pr, 1993, 296 p., illus., hardcover, \$25.00.

**The Human Odyssey: Four Million Years of Human Evolution** — Ian Tattersall. This synopsis of the major evolutionary findings, including *Gigantopithecus*, the Black Skull, Java Man, and Lucy, features full-color photographs of many of the artifacts and displays housed in the new Hall of Human Biology at the Museum of Natural History in New York City. The author, a curator with the museum, traces the work of researchers and explorers from Darwin to the present and provides an in-depth look at how Neandertals lived and our relationship to them. A good overview for anyone interested in our ancestry. P-H, 1993, 191 p., color photos and illus., hardcover, \$27.50.

**The Lemurs' Legacy: The Evolution of Power, Sex, and Love** — Robert Jay Russell. In this introduction to the emerging field of evolutionary psychology, Russell examines the relationship between the psychological evolution of humans and that of their primate ancestors. He proposes many controversial theories based on his own intensive research of primate and lemur species that date back 50 million years. Russell suggests, for instance, that our psyches are predetermined by our genetic heritage, including characteristics of child abusers; that we are only recently monogamous; and that language originated for the purpose of deceptive communication. He also tackles such provocative topics as free will, human gender differences, and extinction. JP Tarcher, 1993, 274 p., illus., hardcover, \$23.95.

**Listening to Prozac: A Psychiatrist Explores Antidepressant Drugs and the Remaking of the Self** — Peter D. Kramer. One of the first physicians to prescribe Prozac discusses the ramifications of this and other mood-altering drugs. Kramer notes that many of his Prozac patients have reported feeling "better than well," more assertive, and mentally keener — attributes that fit with the current notion of a socially acceptable personality, he contends. While continuing to advocate Prozac for the truly depressed, Kramer questions the use of the drug for personality adjustments or eating disorders. Viking Penguin, 1993, 409 p., hardcover, \$23.00.

**Things That Make Us Smart: Defending Human Attributes in the Age of the Machine** — Donald A. Norman. Why should the human mind adapt to fit new technologies rather than the other way around? This is the central question addressed in psychologist Norman's latest book. He details how people work with new concepts and raises the possibility that new technologies will change the way we think rather than assist our inherent capabilities. He also suggests ways to make new machines more human-centered. Addison-Wesley, 1993, 290 p., illus., hardcover, \$22.95.

To order by Visa or MasterCard,  
call 1-800-544-4565  
In D.C. Area: 202-331-9653