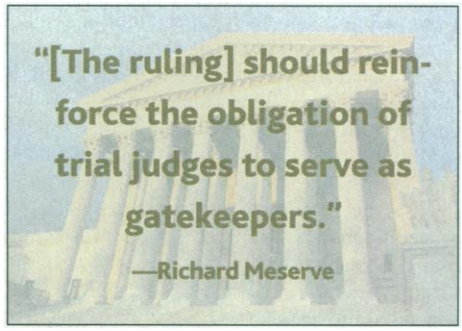
now under way, processes will be in place to correct any problems by 23 April. "I suspect the total suspension may not be lifted at that time," predicted Feussner, but he said that by then it may be limited to human studies.

–JON COHEN

EXPERT WITNESSES

Court Views Engineers As Scientists

When engineers seek to testify in court as expert witnesses, judges should hold them to the same standards as scientists, the U.S. Supreme Court ruled last week. The 23 March decision, in a case called *Kumho* v. *Carmichael*, says judges may disallow testimony from engineers that doesn't meet broad scientific standards for reliability. The ruling was applauded by the National Academy of Engineering (NAE) and other organizations that had submitted briefs urging the high court to recognize the scientific basis of engineering. However, legal experts say that it leaves plenty of leeway—and uncertainty—in judging the validity of expert testimony in fields, including clinical medicine and forensics, that often rely on experience rather than scientific practices such as publication and peer review.



"I feel good about this decision," says William Wulf, president of NAE, which had argued that although engineering differs from science in trying to modify rather than understand nature, its methods are no less scientific. Adds attorney Richard Meserve, a former physicist who prepared the NAE brief, "It should reinforce the obligation of trial judges to serve as gatekeepers, to look at the background of the expert witnesses and examine how they arrived at their conclusions."

The gatekeeper role was spelled out in a 1993 case, *Daubert* v. *Merrell Dow Pharmaceuticals*, in which the Supreme Court proposed four factors that judges could weigh in deciding whether expert-witness testimony from scientists was relevant and reliable. The court suggested that judges should consider the testability, error rate, and degree of acceptance in the community of the analysis, including whether results had been peer reviewed and published (*Science*, 2 July 1993, p. 22).

The current case (97-1709) began with a suit filed by the Carmichael family of Alabama against Kumho Tire Co. after a blowout in 1993 caused an accident that killed one of their children. The plaintiff's case rested on testimony from a mechanical engineer and tire analyst, Dennis Carlson Jr., who said the blowout resulted from a defect in the tire's design or manufacture rather than from wear or improper care and use. The lower court excluded his testimony, submitted in a deposition, saying the analysis was scientifically flawed. An appellate court reversed the decision, ruling that Carlson's testimony was based on his experience rather than scientific analyses and was therefore not covered under *Daubert*. The company appealed to the high court, which heard the case in December.

Last week's decision, written by Justice Stephen Breyer, reverses the appellate court and extends *Daubert* to engineering. But legal experts say that it still gives judges great discretion to accept or reject expert testimony. "It does not knock out experience [as a basis for expert knowledge], but it emphasizes reliability and relevance," says Margaret Berger of the Brooklyn (NY) Law School. "I suspect that the way it's applied will vary from circuit to circuit."

That variability worries some scholars. "When Justice [Harry] Blackmun wrote the *Daubert* decision, he was clearly thinking of what it is that scientists do," says law professor Michael Green of the University of Iowa, Iowa City. "But what about accident reconstructionists? They wouldn't think of publishing their work in a journal or having it peer reviewed. What Breyer did is invite trial judges to look carefully at an expert's methods and reasoning and to throw it out if it's flawed. But what's acceptable to one judge may be unacceptable to another judge. And uncertainty means more litigation."

Meserve and others disagree. "I think the ruling sends a message to judges that [weighing expert witnesses] is an important job that they must take seriously," he says. Berger says she's "amazed" at the detailed discussion of tire composition and tread wear in Breyer's decision and speculates that he may have wanted to show trial judges how to approach such questions. Meserve also hopes the decision may weed out frivolous suits by raising the stakes for plaintiffs' lawyers and experts themselves. "After *Kumho*," he says, "they ought to be embarrassed if a judge finds their testimony not acceptable."

–JEFFREY MERVIS

ScienceScope

Delayed ... or Dead? A federal judge has ruled that the National Park Service must complete an environmental review before it can move ahead with a controversial bioprospecting contract. Government analysts say the ruling is a temporary setback for the precedent-setting deal, which allows Diversa, a San Diego biotechnology firm, to harvest plants and microbes from the park's hot springs in exchange for a $175,000 payment and royalties on any products it develops (*Science*, 13 March 1998, p. 1624).

But one plaintiff's attorney believes the decision—handed down last week by Judge Royce Lamberth of the U.S. District Court in Washington, D.C.—is a death knell for any arrangement of this kind because Lamberth cast doubt on the government's claim that parks are "outdoor laboratories" available for commercial research. A coalition of nonprofits will soon be back in court seeking to ban such deals outright, promises Andrew Kimbrell of the Washington-based International Center for Technology Assessment. Unless Congress changes the law, he asserts, federal parks should remain off limits to profit-driven bioprospectors.

All Too Human Indian scientists hope emerging guidelines for research on human subjects will help reduce the risk of ethical problems. Jarred by the realization that the government regulates studies using animals more heavily than those involving people, the Indian Council of Medical Research (ICMR) last year began a review of 20-year-old human research guidelines that women's groups and others say need to be updated.

Last week in New Delhi, the council completed a quartet of public meetings on a 100-page draft of the new guidelines, which tackle everything from transplant rules to the thorny problem of obtaining informed consent from subjects in a country where illiteracy is widespread. Finalizing new "clear-cut and mandatory guidelines" would help researchers avoid trouble, says Kamal Hazari of Mumbai's Institute of Research in Reproduction. But guidance alone may not be enough, some researchers say. New national legislation that imposes penalties on violators may be needed to put some teeth into the guidelines, which the ICMR hopes to finalize this summer.

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