ment and Budget at the White House on whether the current law bars federal support for work with the new cell lines. If they determine that it does not, researchers may be able to use the cells even if Congress does not change the law to make the permission explicit. "I hope we will have an answer to these questions soon," Varmus said, but "I can't say how long it will take."

–ELIOT MARSHALL

EXPERT WITNESSES

Scientific Panel Clears Breast Implants

Kicking off a momentous 2 weeks for science in the courtroom, a scientific panel on 30 November issued a long-awaited report finding no evidence that silicone breast implants cause systemic diseases in women. The report may lay to rest one of the biggest scientific-legal controversies of the decade, involving thousands of lawsuits seeking billions of dollars in damages. "It is absolutely as strong a report against the plaintiffs' position as one could imagine," says Michael Green, a law professor at the University of Iowa, Iowa City.

Legal scholars are paying close attention, because the panel is part of a sea change in courtrooms since a 1993 U.S. Supreme Court ruling called on trial judges to scrutinize the validity of scientific evidence themselves before it is presented to a jury. "Before, there probably never would have been a scientific panel in such really important litigation," says Daniel Capra, a professor at Fordham Law School in New York City. Scientists may not be the only experts affected: Earlier this week the Supreme Court heard arguments in a case in which it could offer guidance as to when other kinds of expert testimony—including that from engineers and physicians—should meet scientific standards.

The backdrop for all this is the 1993 Supreme Court decision in *Daubert* v. *Merrell Dow Pharmaceuticals*, in which the court called on federal trial judges to act as "gatekeepers" and screen out so-called junk science. The court suggested four tests, including whether an expert's views had been peer reviewed. Before then, the standard was "general acceptability" of the views. Although the decision has in some cases allowed into the record more novel kinds of testimony, such as DNA evidence, experts say *Daubert* has led overall to less scientific testimony being aired to juries.

The *Daubert* ruling also triggered wider use of Federal Rule 706, a 23-year-old law that says federal courts can assemble their own advisers. That's what Judge Sam J. Pointer Jr. of the U.S. District Court in Birmingham, Alabama, did in October 1996, when he convened an independent panel to review evidence in several thousand lawsuits claiming that breast implants caused debilitating symptoms ranging from fatigue to sore joints. Pointer asked the four-person panel* to consider whether existing research "provide[s] a reliable and reasonable scientific basis" for concluding that silicone breast implants "cause or exacerbate" lupus or other connective tissue diseases, or "atypical" immune diseases, according to the report.

Lawyers for both sides each winnowed over 2000 studies and other documents to about 40 they deemed most important for review in each expert's area. The panelists also heard scientific witnesses. Their nearly 300-page report† finds that implants are not entirely benign: It says, for example, that animal studies show silicone breast implants can cause inflammation, and that silicone droplets may wind up in tissues far from the breasts. But the "preponderance of data" does not link these effects to autoimmune disease in people, the report says. The panel's epidemiologist, who conducted several analyses of data pooled from both published and unpublished studies, found "no association" between implants and connective tissue or immune system disease.

The clean bill of health thrills implant-makers. "This is going to help bring an end to this controversy," says Doug Schoettinger, managing trial counsel for Dow Corning. Ironically, Dow Corning, which is in bankruptcy, proposed to settle its suits for $3.2 billion just a few weeks before the scientific panel released its findings. The report, however, is expected to influence Dow Corning's adversaries whether to settle or go to trial. In addition, videotaped depositions will be used in the cases overseen by Pointer.

But the report's shades of gray—including its frequent criticisms of how studies were done—has led some experts to conclude that the jury is still out. "They're saying the science is inconclusive and in many ways contradictory," says Robert Garry, an immunologist at Tulane University in New Orleans who studies women with implants. Indeed, adds Diana Zuckerman of the Institute for Women's Policy Research in Washington, D.C., the studies may not have identified problems that might develop several years after women get implants. Zuckerman says her group will reserve judgment until next year, when results are expected from a National Cancer Institute study of 17,500 women.

For now the broader legacy of the Pointer panel is unclear. "It will be interesting to see if it has an impact on future toxic tort litigation given the expense and time that it took"—$800,000 from the Federal Judicial Center and 2 years, says Margaret Berger of Brooklyn Law School. One occasion for using such a panel, says Green, might be a class-action suit in which "the evidence is emerging" and thus hasn't been weighed by scientists; he points to mounting litigation involving fen-phen, the diet drug combination implicated in heart valve disease.

Whether *Daubert* should apply to testimony from other experts, such as engineers

NUMBER OF CASES OF CONNECTIVE TISSUE DISEASES ATTRIBUTABLE TO BREAST IMPLANTS EACH YEAR

Disease	Relative risk	Cases*	Cases "due to" breast implants*
Rheumatoid arthritis	1.15	3303	4.29
Systemic lupus erythematosus	1.01	526	0.05
Scleroderma/Systemic sclerosis	1.30	164	0.38
Sjögren's syndrome	1.47	400	1.28
Dermatomyositis/Polymyositis	1.52	54	0.18

* Per 10 million women.

SOURCE: NATIONAL SCIENCE PANEL REPORT

Needles in a haystack. In a worst-case scenario, silicone breast implants would cause a handful of cases of these diseases, according to a scientific panel's analysis of pooled population studies.

* Immunologist Betty Diamond of the Albert Einstein College of Medicine in New York City, epidemiologist Barbara Hulka of the University of North Carolina, Chapel Hill, toxicologist Nancy Kerkvliet of Oregon State University in Corvallis, and rheumatologist Peter Tugwell of the University of Ottawa.

† See www.fjc.gov/BREIMLIT/mdl926.htm

and doctors, was the question before the Supreme Court earlier this week. The case, *Kumho Tire Co.* v. *Carmichael*, involves a minivan that crashed after a tire blew, killing one person; Carmichael, the victim's family, presented an engineer who claimed the tire was defective. Kumho's lawyers won in a trial court, which found that the testimony failed to meet *Daubert* tests. An appeals court reversed the decision, however, finding that technical testimony based on experience should not have to meet scientific standards (*Science*, 11 September, p. 1578).

In the hearing, justices expressed a range of views. Several agreed it would be impossible to scientifically test, say, an art expert's assertion that a color in a painting was deep magenta. On the other hand, Justice Antonin Scalia echoed Kumho's argument that the tire expert's testimony should have met scientific standards because it was based on a methodology: process of elimination. The engineer had asserted that because the tire did not appear to have several indications of abuse, its failure must have been due to a defect. The court's ruling, if it issues one, is expected next summer.

Clarifying how courts should evaluate expert opinion of all stripes will not be easy, says Berger, who co-authored an amicus brief for the Carmichael side. "I'm not sure you can come up with a magic formula."

–JOCELYN KAISER

PLANETARY IMPACTS

Argentina, and Perhaps Its Life, Took a Hit

The 10-kilometer-wide asteroid that wiped out the dinosaurs and many other species 65 million years ago was just one of a steady stream of debris of all sizes that has splattered the planet. Some impacts were small, leaving no more trace than a shooting star, while other, larger ones presumably could have triggered near-global crises. On page 2061 researchers suggest that a lesser impact showered coastal Argentina with blobs of molten glass 3.3 million years ago, perhaps cooling climate and driving some of the region's mammals to extinction. But other researchers say that although the impact looks real, its connection to climate change or extinctions is doubtful.

Cratering specialist Peter Schultz of Brown University in Providence, Rhode Island, got his first clue to the impact 5 years ago on a visit to Argentina, when an interpreter mentioned odd green glass she had picked up as a child. Schultz eventually explored sea cliffs of windblown dust deposits called loess near the coastal town of Miramar, working with geologist Marcelo Zarate of the Regional Center of Scientific and Technical Investigations in Mendoza, Argentina. The cliffs expose a layer of glassy, bubble-filled slabs 0.5 to 2 meters across; called escorias locally and first reported in 1865, these rocks had been attributed to everything from lightning strikes to ancient human-tended fires.

But after close study, Schultz, Zarate, and their colleagues conclude that an impact had fused loess into glassy slabs and flung them across at least 50 kilometers of the central coast of Argentina. The glass has streaky flow patterns typical of rapidly cooled impact glass, mineral breakdown products that require temperatures even hotter than those of lightning and volcanoes, and a chemical composition resembling that of the local loess. "It's fascinating stuff," says meteoriticist and cratering specialist Theodore Bunch of NASA's Ames Research Center in Mountain View, California. "I think [the impact] interpretation is probably correct." Schultz presumes that a body perhaps a kilometer in diameter hit just offshore, producing a now-buried crater perhaps 20 kilometers in diameter.

Radiometric dating of the glass showed that the object struck 3.3 million years ago. The date of the glass layer will give paleontologists studying the region's abundant mammal fossils a long-sought benchmark in time. But Schultz and his colleagues suggest a more provocative role for the impact. Based on the glass's radiometric age and its position in the record of Earth's flip-flopping magnetic field, they establish that the impact happened within about 100,000 years or so of an abrupt, temporary 2°C cooling of ocean bottom waters recorded in Atlantic and Pacific sediments. What's more, they say, a major, sudden extinction at about this time wiped out 36 genera of mammals, mostly kinds known only from that region. They suggest that the impact either

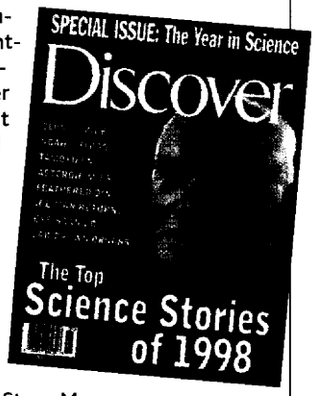
Sign of a killer? The impact that forged this 2-millimeter blob of molten glass in Argentina 3 million years ago may also have caused mammal extinctions.

CREDITS: (BOTTOM) SCHULTZ *ET AL.*

ScienceScope

DISCOVER EDITOR OUSTED

The heavy hand of Mickey Mouse descended on *Discover* magazine today, ousting Editor-in-Chief Marc Zabludoff. Insiders say Zabludoff was bounced after banging heads with the new head of publishing at Walt Disney Co., which bought *Discover* in 1991.



Disney managers have tightened their control of late over decisions about the design and content of the magazine, which has a circulation of 1.2 million. Staff members were irked by Disney Senior Vice President Steve Murphy's insistence that John Glenn grace the cover of their year-end January issue, which will feature the top science discoveries of 1998. Glenn's flight "didn't seem like one of the top stories of the year," says one editor. Murphy could not be reached for comment.

Zabludoff was looking on the bright side. "I get to replace frustration with mere anxiety," he says, "and that's probably a step up." His successor will be Stephen Petranek, editor-in-chief of *This Old House* magazine.

CLAMPING DOWN ON HUMAN CLONING

Britain may have discovered how to clone mammals—to wit, Dolly the sheep—but its biotechnicians should never use these skills to reproduce a human being, according to a new report from the Human Genetics Advisory Commission and the Human Fertilization and Embryology Authority.

The report says the government should enact a law outlawing reproductive cloning of humans. At the same time, it says, the law should permit scientists to clone human cells and even produce human embryos for certain types of research. After gathering comment on its proposals, "there was very little support" among the public for cloning individuals, says commission member Sir Colin Campbell, vice chancellor of the University of Nottingham. But the report noted that people did not object to cloning human cells, if aimed at treating serious illnesses.