UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD
1100 Wilson Boulevard, Suite 910
Arlington, VA 22209

December 3, 1992

Via FAX

Dr. Paul W. Pomeroy
ACNW Member
c/o Rondout Associates
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Dear Paul:

I have just read the U.S. District Court Opinion by Judge Michael M. Mihm of July 23, 1992 attached to your letter, and I wanted to share some thoughts while this "late night reading" is fresh in my mind. These thoughts represent my individual opinion, prior to any discussion with my colleagues at NWTRB. Overall, I am impressed with Judge Mihm's Opinion, which seems to me quite soundly reasoned and well supported. I think the Opinion illustrates that the law does have means to determine whether an expert is appropriately qualified to present testimony in a specific area of science, and that flawed expert testimony may be identified and rejected by a judge without presentation to a jury. The specific case in question is clearly one-sided, but it may be representative of a widespread phenomenon of poorly supported expert testimony - "junk science in the courtroom".

An ability to discriminate "junk science" may be very important. As a member of NWTRB I have listened to a (retired) college professor state before one of our panels that the proposed Yucca Mountain repository could blow up like the Chernobyl reactor. I think it should be expected that "junk science" will be brought into the licensing hearings on Yucca Mountain. The licensing process will clearly benefit from a legal standard that can rule out obvious "junk science".

The second problem is whether expert opinion not directly supported by measurements will be admissible. I do not read this Opinion as suggesting that such testimony will be inadmissable or dealt with in a capricious and non-scientific way by a court. I am encouraged by the standards used in the Mihm Opinion. As a thought experiment, consider the application of such standards to testimony that might be presented by Jerry Szymanski -- or by Bruce Crowe. Would such testimony be counter to published literature or to testimony from a group of highly authoritative scientists from outside DOE? Would the reasoning used to reach conclusions stand up as logically sound under detailed scrutiny such as was given to Dr. Karl Schnabel's testimony?

Especially in the aftermath of the Nov 18-20 DOE Expert Judgment Workshop (which was highly successful, in my opinion), I think it would be very useful for both DOE and NRC to carry out in-depth investigations on legal aspects regarding the admissibility and use of expert judgment in the adjudicatory process, as you suggest in your letter of November 11 to me. For DOE, the issue is how to present expert judgment that is highly credible, because it is well reasoned, supported by available data, consistent with the body of scientific literature and the judgment of authoritative scientists outside the DOE program, and clearly explained. For NRC, the issue may be that of interpretation of expert judgment, so as to identify strengths and weaknesses in order to facilitate evaluation of the license application. Clearly, both DOE and NRC are going to need guiding principles, plus practice in implementing these principles. Learning by doing in the first-ever licensing proceedings for a high-level nuclear waste repository could be very expensive for our country.

I would like to invite your suggestions for how we (ACNW, NWTRB, NRC, and/or DOE) might proceed further in this area. One route might be to involve legal scholars (e.g., law school professors) in carrying out a review of relevant legal principles and case law. I think there is a potential problem in having scientific advisory groups such as ACNW and NWTRB and our scientifically trained staffs try to assemble expertise on legal issues, but it is clearly within our charters to point out the need for this expertise. Second, it is my impression from the workshop that relatively few of the scientists or managers on the DOE program have had substantial experience as expert witnesses. NRC staff have had extensive experience in adjudicatory hearings on complex scientific issues. While some presentations at the Nov 18-20 Workshop provided an indication of lessons from such experience, much more could be done to familiarize the DOE program with the situation they will face in the licensing hearings.

Thanks again for your thoughtful letter of November 11. It was next best to having you at the Workshop. I look forward to further discussion with you on what future courses of action might be most fruitful.

Sincerely,

Warner

D. Warner North
Member

cc (reg mail): Members of the NWTRB Risk and Performance Assessment Panel (incl. Garry Brewer), plus L. Reiter, J. Cantlon, and W. Barnard. Copy of the correspondence file including the Mihm Opinion to TRB staff (Reiter). Note on copies to others that Mihm Opinion and related ACNW correspondence can be obtained from L. Reiter at NWTRB.

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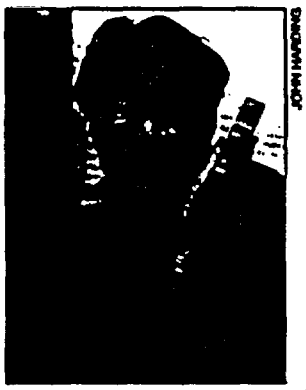
Supreme Court to Weigh Science

It may set standards for who can qualify as an expert witness and what kinds of science can be presented to a jury; scientists and scientific organizations are giving the Court plenty of advice

The difference between "good" and "bad" science may be easier to detect than to define. But the Supreme Court has signaled that it's ready to take a crack at defining high- and low-quality science—or at least to set some new standards for expert scientific testimony in court. And if the Court weighs in on this issue, it may set a landmark that could affect many cases hinging on complex science issues in the future—ranging from DNA fingerprinting to the health effects of exposure to substances such as Agent Orange and asbestos.

The Court signaled its interest when it agreed recently to hear arguments in a case in which parents of two children with birth defects are suing the manufacturer of a drug called Bendectin, claiming that it caused the defects. In lower [illegible] the attorneys for [illegible]ildren had assembled evidence against the drug from several scientists with credentials in epidemiology and pathology. The manufacturer, Merrell Dow, responded that—regardless of credentials—the science was poor. Judges in the lower courts had agreed with defense lawyers, ruling that the plaintiffs' science didn't deserve to be presented to a jury —indeed, barring it from use. Now the Supreme Court has positioned itself to make landmark law by examining the lower courts' rationale for rejecting "expert" testimony.



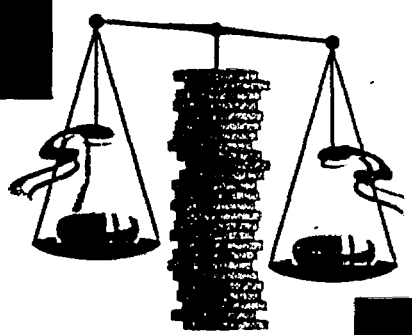
JOHN HARDING

For the scientific community, the stakes —and opportunity—of this case, which has received widespread public attention with a front-page article in *The New York Times*, were immediately obvious. To many scientists and their institutions, the Court was suddenly providing them with a chance to strike out against "junk science." In a flurry of legal briefs, the American Association for the Advancement of Science (AAAS), which publishes *Science*, the National Acad[illegible] Sciences (NAS), and the American [illegible] Association—among many others—have rushed to argue that the judges must exercise the same kind of peer review that scientists do, keeping untested theories out of the courtroom. On the other side, trial lawyers, concerned epidemiologists, and some historians of science—including Stephen Jay Gould—have argued that judges cannot use any simple rule to decide what makes for good science, and that they should let jurors weigh relevant evidence from all qualified experts. These contradictory stances, offered in the form of at least 20 advisory "amicus," or friend-of-the-court, statements, had reached the Court by the final deadline of 19 January (see scorecard).

> **SPECIAL NEWS SECTION**
>
> A special News report on breast cancer research begins on page 616. The News section that begins on this page combines News & Comment and Research News.

Standards of credibility

The roots of the events that triggered this flurry of legal paperwork go back to the 1970s, when millions of pregnant women took Bendectin to reduce morning nausea. In 1983, Merrell Dow, faced with a barrage of lawsuits from parents who claimed Bendectin caused their children to be born malformed, took the drug off the market. But one of the cases that prompted this action proved to have a life of its own. In it, attorneys for Jason Daubert and Eric Schuller, two children with birth defects, gathered evidence from test-tube and animal testing of Bendectin that suggested the drug could cause birth defects. And they assembled expert witnesses to testify that epidemiological evidence showed an association between Bendectin use and human birth defects. The most prominent of these experts was Shanna Helen Swan, an epidemiologist trained at the University of California, Berkeley, and now director of a California state health department group that monitors reproductive risk.



HARVARD LAW SCHOOL

Who should judge? Epidemiologist Shanna Helen Swan's *(above)* unpublished data were ruled inadmissible; lawyer Charles Fried *(right)* says only widely accepted science should be allowed.

Merrell Dow's attorneys, however, argued that the evidence wasn't credible because it had not been peer reviewed or published and was contradicted by 30 published epidemiological studies. Judges in two lower courts in California agreed, ruling that the plaintiffs' science was inadmissible. And, so far, it hasn't been presented to a jury, because the case has been dismissed in each courtroom, most recently by the Ninth Circuit Court of Appeals.

But the children's attorneys took the matter all the way to the Supreme Court. Oral arguments are to be made in late March, and the Court is expected to issue a decision by summer.

The Court's interest came as a surprise to the likes of Richard Meserve, a Washington, D.C., attorney at the Covington & Burling law firm who filed the AAAS and the NAS amicus brief. The Court has had many opportunities to review the standards of scientific testimony in the past and has repeatedly avoided doing so. Indeed, the last time the federal courts issued a broad ruling on scientific testimony was in 1923, in a case known as *Frye* v. *United States*. It gave rise to a standard known as the "Frye rule," which states that expert witnesses should be permitted to give evidence only if their conclusions derive from a principle that is "sufficiently established to have gained general acceptance in the particular field in which it belongs." As a practical matter, this means a judge has the power to hold a pretrial hearing to determine whether expert witnesses and their testimony meet a reasonable scientific standard. And in fact, this is what happened in the Daubert *et al.* case.

Both the district court judge and the