

THE EFFECT OF *DAUBERT v. MERRELL DOW PHARMACEUTICALS* ON THE ADMISSIBILITY OF EXPERT TESTIMONY

by
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In 1993, the United States Supreme Court decided the case of *Daubert v. Merrell Dow Pharmaceuticals*¹. This decision represented the first time that the country's highest court addressed the issue of which standards apply in federal courts for admitting expert testimony on scientific issues. This article discusses the standard used prior to the *Daubert* decision, the *Daubert* decision itself, and a look at how *Daubert* has so far affected the standards for admitting scientific expert testimony in aviation-related cases.

I. The Seasoned Standby: The *Frye* test

For the seventy years preceding the *Daubert* decision, the majority of jurisdictions followed the test announced in *Frye v. United States*² in determining whether an expert who wished to testify on a scientific issue would be permitted to do so. In *Frye*, an attempt was made to introduce evidence which was obtained from an early version of a polygraph (lie detector) machine. The trial court refused to admit expert testimony regarding the machine. In affirming that refusal, the Court of Appeals for the District of Columbia held that:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.³

The court determined that the use of such a device had not gained acceptance among scientific authorities, and the testimony was therefore ruled inadmissible.

The *Frye* "general acceptance" test was not a Supreme Court decision, and so was not the "law of the land". Still, a large majority of federal courts adopted the rule in one form or another, especially early on.

¹ 113 S.Ct. 2786 (1993).

² 293 F. 1013 (D.C. Cir. 1923).

³ 293 F. at 1014.

With the passage of time, however, some courts expressed doubts that the test was a dependable gauge for insuring that reliable evidence would be admitted while unreliable evidence would be excluded. Some courts flat out repudiated the rule; others used it as a baseline and built upon it. There was, therefore, no uniform standard in the federal courts for admitting expert testimony.

II. Adoption of the Federal Rules of Evidence

In 1975, the Federal Rules of Evidence were introduced. Certain of the Rules relating to admissibility of evidence generally, and those relating to expert testimony, more specifically to scientific expert testimony, are especially pertinent.

Rule 702 states that "[i]f scientific, technical or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training or education" may testify in the form of an opinion.

Rule 703 requires that expert opinions based on otherwise inadmissible hearsay may be admitted only if the facts or data are "of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject."

According to Rule 704, "[t]estimony in the form of an opinion or inference otherwise admissible is not objectionable because it embraces an ultimate issue to be decided by the trier of fact."

Finally, the more general Rule 403 states that relevant evidence may be excluded "if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence."

The effect, if any, that the Federal Rules of Evidence were to have had on the *Frye* test for admitting expert testimony was not expressed in the Rules themselves. Certain courts assumed that the Rules were to be read in conjunction with the *Frye* requirement of general acceptance in the scientific community. As dissatisfaction with *Frye* as the sole controlling standard of admissibility grew, however, some courts looked toward these same rules as the basis for finding a standard apart from the *Frye* general acceptance test. The emphasis in those courts shifted more toward determining the **reliability** of the evidence to be presented as the gauge for deciding whether it should be admitted. Some courts rejected the *Frye* test outright, while others built upon it, holding that *Frye* was to be but one factor that was to be considered, along with other Federal Rules-based factors that were to be weighed in as well. For example, one court added to the *Frye* requirement of general acceptance the following tests: whether the witness is qualified to express an expert opinion in accordance with Federal Rule 702; whether the facts upon which the expert is relying are of the type relied upon by other experts in the field, in accordance with Rule 703; and whether, assuming that these were all met, whether the

testimony's potential for unfair prejudice outweighs whatever probative value it might have, under Rule 403.⁴

III. The *Daubert* Decision

As the *Frye* test saw mounting criticism as a standard for admitting expert testimony, an increased lack of uniformity among the courts resulted. The introduction of the Federal Rules of Evidence did not alleviate the disparity; if anything, it added to it. Eighteen years after the introduction of the Rules, the United States Supreme Court saw fit to address the issue of admitting expert testimony, in the case of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*⁵

In *Daubert*, two minor children and their parents alleged that serious birth defects suffered by the children were caused by their mothers' prenatal ingestion of a drug called Bendectin. Bendectin was a prescription anti-nausea drug marketed by the defendant Merrell Dow. Suit was filed in California state court but was removed to federal court on diversity grounds. Merrell Dow moved for summary judgment after considerable discovery, on the grounds that Bendectin did not cause birth defects in humans and that plaintiffs would have no admissible evidence that it did. In support of the motion, Merrell Dow submitted the affidavit of a well-credentialed expert in the field of birth defect epidemiology (statistical studies) that the user of Bendectin had not been shown to be a risk factor for human birth defects. The expert's conclusion was based upon his review of all the literature available on Bendectin and human birth defects, which included more than 30 published studies. None of these studies found the drug capable of causing malformations in fetuses.

In opposing the motion for summary judgment, the plaintiffs adduced testimony from eight of their own experts, each of whom were also well-credentialed. As expected, these experts concluded that Bendectin *can* cause birth defects. This conclusion was based on, among other things, test tube and live animal studies which found a link between Bendectin and malformations, as well as a "reanalysis" of the previously published epidemiological studies.

The trial court granted the motion for summary judgment, effectively employing the *Frye* test in stating that the scientific evidence is admissible only if the principle upon which it is based is "sufficiently established to have general acceptance in the field to which it belongs." The trial court concluded that the plaintiffs' evidence did not meet this standard, because of the vast body of epidemiological data which existed regarding Bendectin. Since so much data was available, the court held that expert opinion which was not based on epidemiological data was not admissible to establish causation; therefore, the studies performed by the plaintiffs' experts could not be used to create a disputable issue on causation. The reanalyses performed by these experts was also ruled inadmissible since they were not published or subjected to peer review.

⁴ See *Christophersen v. Allied-Signal Corp.*, 939 F.2d 1106 (5th Cir. 1991), *cert. denied*, 503 U.S. 912 (1992).

⁵ 509 U.S. 579, 113 S. Ct. 2786 (1993).

The Ninth Circuit Court of Appeals affirmed the granting of summary judgment to Merrell Dow. It explicitly cited the *Frye* standard and held that expert opinion based upon a methodology that diverges significantly from the procedures accepted by recognized authorities in the field cannot be shown to be generally accepted as a reliable technique. The court cited to other cases where the risks of Bendectin were in issue, and where reanalyses of epidemiological studies were not admitted. These were unpublished reanalyses which were found problematic in view of the massive weight of the original published studies which found no link to birth defects. The court held that reanalyses are generally acceptable only when subjected to verification and scrutiny by others in the field, and rejected the plaintiffs' experts reanalyses as "unpublished, not subjected to the normal peer review process and generated solely for use in litigation".

The United States Supreme Court granted certiorari, citing sharp divisions among the courts regarding the proper standard for the admission of expert testimony. The Supreme Court concluded that the Federal Rules of Evidence, and not *Frye*, provide the standard for admitting expert scientific testimony in a federal trial.

The Court noted that *Frye* was the dominant standard for determining admissibility of novel scientific evidence at trial. It held, though, that the adoption of the Federal Rules of Evidence superseded *Frye*. While the common law could be used to serve as an aid to the Rules' application, the Rules did not assimilate the common law *Frye* test. "General Acceptance" is not found in the Rules as a necessary precondition to the admissibility of scientific evidence.

The Court stated that the Rules, and especially Rule 702, placed the necessary limits on the admissibility of scientific evidence by requiring that the trial judge make the determination as to whether the expert's testimony is reliable and relevant. Rule 702 requires that the expert's testimony pertain to "scientific knowledge". "Scientific" implies a basis in scientific methods and procedures; "knowledge" implies a body of known facts or of ideas inferred from those facts, or accepted as true. Rule 702, therefore, establishes the foundation for a reliability standard.

The Court identified a second element which must be determined by the trial judge when faced with proffered expert scientific testimony - that is, whether the scientific knowledge will assist the jury in understanding the evidence or determining a fact in issue. This requirement, another element of Rule 702, was stated to go primarily to relevance by demanding a valid scientific connection to the pertinent inquiry as a precondition to admissibility.

The Court recognized that many factors bear on the above two inquiries to be undertaken by the trial judge, and the Court, therefore, suggested a list, admittedly not definitive, of factors to be considered:

1. whether the proffered theory or technique has been or can be tested;
2. whether the theory or technique has been subject to peer review and publication (publication being relevant but not solely determinative of admissibility);

3. what the known or potential rate of error is for a particular scientific technique; and,
4. whether the theory or technique has achieved widespread acceptance.

Note that the fourth factor is the *Frye* standard, which the Supreme Court has relegated under *Daubert* to be just one factor for a court to consider when making an admissibility of expert opinion determination. The Supreme Court was careful to note that the judge must also take into account the other relevant rules, including Rules 703 and 403.

In summarizing, the Supreme Court noted that "the overarching subject is the scientific validity - and thus, the evidentiary relevance and reliability - of the principles that underlie a proposed submission. The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate."⁶

IV. The Effect of *Daubert* to Date in Aircraft Cases

To this point there have not been many published decisions involving aircraft cases wherein the *Daubert* standard has been applied. A few of those that have considered *Daubert* will be discussed briefly.

In *Joy v. Bell Helicopter Textron*⁷, the Court of Appeals for the District of Columbia referred to *Daubert* after holding that expert testimony from an economist as to projected future earnings for a passenger killed in a 1987 crash of a helicopter in the Potomac River was merely speculation, guesswork and conjecture. The court held that Rule 702 permitted expert testimony, but not to the extent of permitting mere speculation in the form of an opinion. The court stated that it would resist "the temptation to answer objections to receipt of expert testimony with the shorthand remark that the jury will give it 'the weight it deserves.' ... Indeed, we have already indicated that we will turn a "sharp eye" to "those instances, hopefully few, where ... the decision to receive expert testimony was simply tossed off to the jury under a 'let it all in' philosophy."⁸

The court noted that its conclusion with respect to the economist's testimony was unaffected by the then just-published *Daubert* decision. "Although the Court in *Daubert* recognized that the Federal Rules of Evidence embody a 'general approach of relaxing traditional barriers to "opinion" testimony,' ... it also emphasized that Rule 702 'clearly contemplates some degree of regulation of the subjects and theories about which an expert may testify'. In particular, the Court observed that Rule 702 permits an expert to testify only when 'scientific, technical, or other specialized knowledge will assist the trier of fact,' ... and that 'the word "knowledge"

⁶ *Daubert*, 113 S.Ct. at 2797.

⁷ 999 F.2d 549 (D.C. Cir. 1993).

⁸ 999 F.2d at 569 (*citations omitted*).

connotes more than subjective belief or unsupported speculation."⁹ The economist's testimony concerning Mr. Joy's future career path was held to fail to meet the standard.

In *Vadala Management Corp. v. Teledyne Industries*¹⁰, the Court of Appeals for the First Circuit affirmed the Massachusetts district court's granting of a motion for summary judgment in favor of the defendant manufacturer of an airplane engine (Teledyne). Vadala purchased a used twin-engine Cessna. The airplane and the engines were twenty years old. While flying, after logging fewer than 50 hours on the airplane, Vadala reported a loss of oil pressure in the right engine. Several minutes later, the plane crashed and burned. Vadala was killed, and most of the wreckage was destroyed in the post-crash ground fire. Vadala's widow and the title owner of the plane sued Cessna and Teledyne. Teledyne moved for summary judgment. The district court granted Teledyne's motion on the ground that the plaintiffs had failed to adduce evidence to support their theory of causation. To better understand the court's reference to *Daubert*, a brief description of the aircraft components at issue is warranted.

Each of the accident aircraft's Teledyne engines contained a viscous torsional damper which functioned to reduce torsional vibration. The damper is a small disk comprised of an inner brass ring that floats in a thin layer of silicone fluid. The ring and fluid are encased in an outer steel shell. The silicone fluid absorbs the torsional vibration and dissipates it as heat. Exposure to extreme high temperatures, however, will cause the silicone in the damper to solidify. This is known as polymerization. When polymerization occurs, the damper's effectiveness is decreased.

In the investigation that followed the accident, the National Transportation Safety Board (NTSB) concluded that at some point - either during the Cessna's final flight or afterward in the ground fire - the silicone in the right engine's viscous torsional damper had polymerized. The NTSB noted that the left-engine damper had also polymerized. The accident was apparently caused when the starter adapter in the right engine came loose from the bolts that hold it to the engine and compromised the oil seal, causing the oil to drain out and the engine to fail.

The plaintiffs naturally alleged that the right-engine damper polymerization occurred during the flight, which caused a ball bearing to fail, which in turn caused the bolts to loosen. Teledyne contended that the polymerization occurred after the crash in the ground fire, and that polymerization would not, in any event, lead to ball bearing failure. The district court found the plaintiffs' allegation that polymerization occurred during the flight was unsupported, and therefore granted summary judgment in favor of Teledyne.

In reviewing the granting of the motion, the Court of Appeals for the First Circuit noted that, to show that polymerization occurred during the flight, and not in the ensuing ground fire, the plaintiffs relied on affidavits and depositions of their expert. The court agreed with the district court's holding that the factual basis and process of reasoning relied on by the plaintiffs' expert did not make his conclusions viable. The expert had examined the damper from the right

⁹ 999 F.2d at 569-70 (*citations omitted*).

¹⁰ 44 F.3d 36 (1st Cir. 1995).

engine and concluded that the polymerization had occurred during the flight. He based this conclusion on his observation that components that were situated adjacent to the damper in the right engine (the rubber oil seal and "O" rings) showed no signs of heat damage from the ground fire. He inferred that polymerization must therefore have occurred during flight rather than in the ground fire. However, he had admitted that he had no idea what temperature would be required to alter the appearance of the rubber oil seal and the "O" rings.

The court noted that there had been a severe post-crash fire and that the left engine damper was found to be polymerized to approximately the same extent as the right, and there was no claim that it had been damaged in flight. The NTSB report noted that the right engine damper had received extensive heat damage.

The court went on to note that the plaintiffs' expert's "conclusion that the damper had not been damaged by ground-fire heat depended on the notion that any ground-fire heat sufficient to cause polymerization would also have altered the appearance of the rubber oil seal and "O" rings. The inference is difficult to sustain unless the expert has some notion of how susceptible the latter parts were to having their appearance altered by heat."¹¹ But his testimony indicated that he did not have an idea as to this susceptibility, and therefore, the Court concluded that his opinions were not reliable.

The First Circuit rejected plaintiffs' counsels assertions at oral argument that the granting of the motion for summary judgement may have conflicted with *Daubert*. The court pointed out that "*Daubert's* holding - that a scientific principle may sometimes be the basis for expert testimony even if it is not "generally accepted" - has nothing to do with this case, in which the dispute concerns an event rather than a scientific law. More pertinent is *Daubert's* countervailing precept: that the trial judge is assigned the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand."¹²

The lesson learned is that *Daubert* does not affect the ability of a court to disallow expert evidence when the scientific principle itself is not being questioned (in this case no one argued that heat could not cause polymerization in-flight; that principle is accepted). Refusal of a court to admit evidence is perfectly valid when there is no basis for concluding that the accepted principle was involved in the subject incident (there was no basis in this case for concluding that, in fact, heat had caused polymerization to occur **in-flight**).

Finally, *Frosty v. Textron*¹³ involved a product liability action arising from the crash of a Bell helicopter operated by the plaintiff's decedent. One of the plaintiff's arguments against the defendants' motion for summary judgment was that Washington law applied to the case and that the action was timely under Washington's statute of repose.

¹¹ 44 F.3d at 39.

¹² 44 F.3d at 39.

¹³ 891 F.Supp. 551 (D. Oregon 1995).

The court held that the statute of repose did not save the plaintiff's action. The relevant statute stated that an injury caused by a product after the product has outlived its useful safe life is not actionable. The statute provided a rebuttable presumption that a product's useful safe life expired 12 years after delivery, so that where more than 12 years had passed since delivery, the plaintiff would have the burden of showing that the product at issue was still within its useful safe life. In this case, the accident occurred just over 15 years after delivery of the aircraft, so the plaintiffs in fact had to meet this burden.

The plaintiff sought to raise an issue of material fact on the issue of useful safe life of the helicopter by submitting the affidavit of a helicopter pilot. This pilot stated that the useful life of a Bell Helicopter is in excess of 15 years and that its useful life would be decades if properly inspected and maintained. The plaintiff also offered the affidavit of a helicopter mechanic. The court held that the plaintiff failed to overcome the presumption under Washington law that the useful safe life of the product expired 12 years after the date of delivery, because it held that these individuals, proffered as experts by the plaintiff, were incompetent to testify on this subject, and that their affidavits were conclusory and speculative. Furthermore, the affidavits failed to satisfy the evidentiary standards set forth in *Daubert*.

The court determined that the mechanic offered a personal opinion as to useful safe life of the helicopter, and that this opinion was devoid of scientific basis. The mechanic performed no tests nor any engineering analysis. "The life limits of a helicopter are in fact determined through sophisticated engineering analysis performed by teams of scientists and engineers in a variety of disciplines before the helicopter is placed on the market and are expressly made a condition of the FAA's approval of the design."¹⁴

Citing *Daubert*, the court went on to note that the pertinent question was whether the plaintiff had adduced enough admissible evidence to create an issue of material fact as to the useful safe life of the helicopter. The court concluded that the plaintiff had not, quoting the *Daubert* court: "The question of admissibility only arises if it is first established that the individuals whose testimony is being proffered are experts in a particular scientific field."¹⁵ The court held that the mechanic and the pilot did not meet the threshold requirement of admissibility because they were not experts on the issue of useful safe life.

The court then went further in its discussion, stating that under *Daubert*, even the subjective opinion of a qualified engineer should be rejected if the opinion is wholly untested, and under *Daubert*, the test is not the correctness of the expert's conclusions, but the soundness of the expert's methodology. This required the plaintiff to show that the pilot's and the mechanic's findings were based on sound science. This in turn required some objective, independent validation of the methodology used. To make their testing admissible, the court stated the expert should explain precisely how they went about reaching their conclusions and

¹⁴ 891 F.Supp. at 553-54.

¹⁵ 891 F.Supp. at 554.

point to some objective source - a learned treatise, the policy statement of a professional association, a published article in a reputable scientific journal or the like - to show that they followed a scientific method, as it is practiced by at least a recognized minority of the scientists in their field.

The court concluded that in the case at bar the plaintiff made no such showing; his affidavits failed to explain the methods and procedures used in reaching the conclusion that the useful life of a properly maintained helicopter is indefinite. The opinions seemed to be based on subjective beliefs and unsupported speculation. There was no testimony regarding performance of any engineering analysis or test required by the Federal Aviation Regulations to determine the safe life of the helicopter. Nor were there any indications that the affiants were capable of performing such analyses or tests. Personal opinion, not science, was the sole basis of their testimony. "Because no technique or underlying theory for the conclusion has been asserted, it is impossible to determine if the technique or the theory used, if any, has been tested or subjected to peer review or publication. It is also impossible to determine the known or potential rate of error."¹⁶ The court summarized that the "expert" affidavits relied upon by plaintiff were conclusory, speculative and inadmissible under the standards set forth in *Daubert*. As such, the plaintiff failed to raise an issue of fact regarding the helicopter's useful safe life. As a result, Washington's limitation period did not save the plaintiff's action.

V. Commentary

The *Daubert* decision is now three years old. It is still too early to state a conclusion as to whether federal courts are finding it any easier to answer the question of when proffered expert testimony on scientific issues should be admitted and when it should not. All that has been made clear by *Daubert* itself is that the *Frye* test does not provide the standard to be followed, and that the Federal Rules of Evidence do. Critics argue that *Daubert* does not give any meaningful guidance on how to gauge the admissibility of scientific evidence. Rather than supply a methodology that trial courts can apply consistently and uniformly in answering concerns about scientific evidence, the non-rigid skeleton which the Supreme Court announced appears to have raised many questions from scholars about what the skeleton means.

This is not to suggest that a methodology that would work uniformly for all cases would be easy to devise. Indeed, the problems in dealing with deciding how to admit expert scientific testimony result from the very reasons for which such testimony is necessary in the first place: scientifically lay judges and juries are, by definition, not knowledgeable enough to decide the technical issues that are to be testified to without assistance from others who have specialized knowledge in the area at issue. It is, therefore, by definition, difficult for those not in-the-know to devise a method for insuring that, in fact, those actually in-the-know are allowed to testify while those who are not are precluded. There is a unique sort of "Catch-22" element to this area of law, and there aren't any easy answers.

¹⁶ 891 F.Supp. at 554.

Still, a way must be found to insure that valid expert testimony is heard while "junk science" testimony is not. Certain of the Supreme Court's rationale in *Daubert* is somewhat disturbing. The defendant had expressed concerns that "abandonment of 'general acceptance' as the exclusive requirement for admission will result in a free-for-all in which befuddled juries are confounded by absurd and irrational pseudoscientific assertions." The Supreme Court responded that the defendant appeared "overly pessimistic about the capabilities of the jury, and of the adversary system generally", and that "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but credible evidence."¹⁷ The defendant may have been slightly overzealous in the description of what pseudo-evidence will be allowed to be heard. The jury system must be depended upon to weed out outright irrational evidence. What it will often **not** be capable of, however, is distinguishing between two seemingly logical scientific views that are at odds with each other. In point of fact, one view is almost always more "correct" than the other, but the jury will have a difficult time determining which. Unlike the situation generally, in which jurors may draw on their life experiences in making their determination as to which testimony appears more believable, in the scientific arena the jury has no basis for determining the credibility of the expert testimony apart from the testimony itself. If both theories are presented well, choosing which one to believe can become an exercise in "coin-tossing". Just as bad, a jury may, as a result, be more swayed to make a decision based on the courtroom theatrics of the trial attorneys and witnesses instead of on the objective evidence.

The fact of the matter is that in most every case, when one set of highly qualified experts testifies "A", the opposing set invariably testifies with equal vigor "not A". If the experts appear equally qualified, and each view can in theory be plausible to those without experience in the field, then the jury will have no objective basis for determining which expert is telling the "scientific truth". What makes this especially troublesome is that, in accordance with Rule 704, experts are not precluded from testifying on ultimate issues of the case. The result of the "coin toss" or the winner of the courtroom "theatrics award", then, can ultimately determine the outcome of the case.

Arguably, a judge is often himself a layperson when it comes to scientific evidence. It then raises the question of whether charging the judge with the responsibility of determining the reliability of proffered expert testimony completely solves the problem. Still, a judge's practical experience behind the bench, including his immunity from courtroom theatrics, likely makes him or her a better choice than the jury in determining reliability of proffered expert testimony.

In any event, it is arguably safer to take a more restrictive approach to admitting expert scientific testimony. The *Frye* test provided a more restrictive view than the more liberal *Daubert* factors. Whether or not *Daubert* ultimately succeeds as a standard will hinge upon the seriousness with which federal judges undertake their obligations as keepers of the evidentiary gate. It is crucial that courts resist any temptation to liberally allow all scientific evidence in,

¹⁷ *Daubert*, 113 S.Ct. at 2798.

requiring the jury to "sort it out". The courts in *Joy*, *Vadala* and *Frosty* took the responsibility seriously. To insure success in keeping in valid scientific expert testimony while disposing of "junk" testimony, future courts must follow these leads.