B130 Pattern Evidence and Conformance to the Requirements of *Daubert*

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The goal of this presentation is to focus on how pattern evidence can be evaluated to conform to the relevancy and reliability requirements of *Daubert*.

By focusing on the verbiage of *Daubert*, this presentation will impact the forensic science community by clarifying the requirements of relevancy and reliability, and discuss the concept of "error rate" as they apply to pattern evidence.

Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579 (1993) changed the admissibility standard for scientific and technical evidence. Prior to 1993, the standard for admissibility in federal and most state courts was defined by *Frye v. United States*, 293 F. 1013 (DC Cir. 1923). "General acceptance" was the standard. In *Daubert,* the Supreme Court referenced the Federal Rules of Evidence (Rule 702) and relevancy and reliability became the requirements to determine admissibility. This session will focus on how pattern evidence can be evaluated to conform to the relevancy and reliability requirements of *Daubert*.

Many discussions on the impact of *Daubert* and the admissibility of expert witness testimony have preceded this session. However, most of these discussions have been based on what participants remember reading in the decision. Few were based on an examination and evaluation of the actual verbiage in *Daubert*. What did the Supreme Court actually say in rendering this landmark decision in forensic science? The two terms which are the cornerstones of *Daubert* are defined in the decision, but not often defined in evaluating conformance: **"Relevancy"** is defined as that which has "any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence. The Rule's requirement that the testimony "assist the trier of fact to understand the evidence or to determine a fact in issue" goes primarily to relevance by demanding a **valid scientific connection** to the pertinent inquiry as a precondition to admissibility.

"Reliability" is established by Rule 702's requirement that an expert's testimony be based on "scientific knowledge." The **adjective "scientific" implies a grounding in science's methods and procedures**; the word **"knowledge" connotes a body of known facts or of ideas inferred from such facts or accepted as true on good grounds**.

The next most significant words which appear in the decision, but which were not defined, and remain undefined by the courts fourteen years later are "**error rate**." What does this mean? What is the origin of the term in the decision? Ask different experts, prepare for different responses. Ask judges who are the "gatekeepers," they will probably not be prepared to answer. Where exactly is the term referenced in the decision and in what context? For the purposes of this discussion, what follows are verbatim excerpts from the decision:

Faced with a proffer of expert scientific testimony under Rule 702, the trial judge, pursuant to Rule 104(a), must make a preliminary assessment of whether the testimony's underlying reasoning or methodology is scientifically valid and properly can be applied to the facts at issue. Many considerations will bear on the inquiry, including ***whether the theory or technique in question can be (and has been) tested, whether it has been subjected to peer review and publication, its known or potential error rate and the existence and maintenance of standards controlling its operation, and whether it has attracted widespread acceptance within a relevant scientific community.*** *The inquiry is a flexible one, and its focus must be solely on principles and methodology, not on the conclusions that they generate.*

Even the Court admits that the "inquiry is flexible." The Justices were clear in emphasizing that all testimony is subject to challenge. Our system is based on advocacy, sound logic which is understandable, and the ability of participants in the judicial system to make logical arguments which are persuasive. If an argument cannot withstand rigorous cross-examination, the challenges to proof beyond a reasonable doubt are more credible. The Court wrote that scientific testimony should be presented in such a way that the jury can understand and use the scientific testimony to formulate a sound decision.

Cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof, rather than wholesale exclusion under an uncompromising "general acceptance" standard, is the appropriate means by which evidence based on valid principles may be challenged. That even limited screening by the trial judge, on occasion, will prevent the jury from hearing of authentic scientific breakthroughs is simply a consequence of the fact that the Rules are not designed to seek cosmic understanding but, rather, to resolve legal disputes.

Here is where the court may have unwittingly left open the gate (remember, the judge is the gatekeeper who can either lock the gate or keep it open) for the admissibility of pattern evidence. Any

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testimony by any "expert" may be, and perhaps should always be "challenged." Valid, scientifically sound testimony will withstand interrogation; junk science testimony will fall under its own weight if challenged correctly.

This discussion will focus on the forensic examination and scientific basis of pattern evidence, the scientific validity of results generated by forensic examiners in presenting the resulting conclusions from these examinations, and their conformance to the actual requirements of the Supreme Curt under the 1993 *Daubert* decision. For this discussion, pattern evidence includes, but is not limited to: latent prints, questioned documents/handwriting, impression evidence such as tiretrack, footwear, and firearms/toolmark evidence. In evaluating these evidence types the resulting conclusions require the comparison of pattern features, as opposed to quantifiable data. This leads to the next questions: Does good science require "quantifiability," or will observations which lead to a valid hypothesis suffice? What is the basis for the following conclusion? "Impression A (the latent print, projectile, toolmark) had its source in Item B to the exclusion of all other sources."

Can this statement be made with the reliability required by *Daubert*? Where is the scientific method validation data associated with this conclusion?

The most contentious pattern evidence issues are associated with the concept of "individuality." What is the scientific justification for the assertion that pattern evidence such as crime scene latent prints, handwriting, stria on projectiles, cartridges and tools, or shoeprints, can be uniquely associated with one person or object to the absolute exclusion of all other people or objects? What scientific testing is needed to verify or reject this assertion? How should this research be carried out and who should do it? Pattern evidence practitioners assert that they are able to make assertions of individuality with total and complete confidence. Their adversaries in the courtroom respond "based on what scientific premise?" Some expert witnesses respond that the validity of such comparisons is based on "experience," or that the comparisons are an "art." To meet the requirement of *Daubert* that answer is no longer acceptable because the Court requires **scientific methods and procedures**, not art or experience.

This session will include forensic scientists and attorneys representing both side of the aisle in the courtroom. Based on the verbiage of the Court in *Daubert*, they will present their views on what constitutes reliability, relevancy, and individuality. They will attempt to answer many of the questions above. The salient question in this session remains: To meet the standards of *Daubert,* are the conclusions in pattern evidence comparisons reliable and relevant because they are based on objective, quantifiable, validated scientific methods and data? The attendees in the audience will determine if their responses withstand "rigorous cross examination."

***Daubert*, Relevancy and Reliability, Error Rate**

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