

Changing Forensic Science from Within

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Forensic Science for the 21st Century

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The Two Heaviest Millstones Dragging Down Forensic Science

1. Methods & Theories Lacking Validation and/or Quantification
2. Incompetent Expert Witnesses

Jill Glick, M.D., University of Chicago pediatrician, testifying in support of the “shaken baby syndrome” theory for ferreting out murders—Feb 2009, Joliet, Illinois, trial court

...the whole point of biomechanic studies is to create what we know happens and biomechanic models have yet to recreate what happens in nature and once those biomechanic models create what we know happens, they will be very valuable for us ...we do know that children are shaken and have traumatic brain injury. ...Not saying that every child with that trauma is shaken. I'm just saying that those that are shaken have been and so if we can't create that in the lab then the lab really doesn't tell us much.

[Emphases added.]

Forensic Science: Oxymoron?

In detective novels and television series, criminals often get caught because they leave fingerprints at the scene. Well, art does imitate life; fingerprint analysis is widely used in U.S. courts and those of many other countries. But last year a funny thing happened to fingerprint evidence on the way to a conviction. Applying the standard set for the admissibility of scientific evidence by the U.S. Supreme Court in the 1993 Daubert case, Judge Louis Pollak ruled that an expert could not testify that the prints at a crime scene matched those of a suspect. Shock reverberated through the criminal justice community, until Judge Pollak induced a sigh of relief from district attorneys everywhere by saying that at least in this case, such testimony could be used after all.

The Supreme Court's Daubert standard has generated some ambiguity for the legal community, but the Court did list several criteria for qualifying expert testimony: peer review, error rate, adequate testing, regular standards and techniques, and general acceptance. Judge Pollak's initial finding was that the evidence flunked all but one. Some distinguished legal scholars think that he was right on that call and wrong on the second. The resulting controversy has reignited some old challenges to "forensic science."

It's not that fingerprint analysis is unreliable. The problem, rather, is that its reliability is unverified either by statistical models of fingerprint variation or by consistent data on error rates. Nor does the problem with forensic methods end there. The use of hair samples in identification and the analysis of bullet markings exemplify kinds of "scientific" evidence whose reliability may be exaggerated when presented to a jury. Some criminal defense attorneys have become concerned about the degree to which processing and enhancement of such images could mislead jurors who believe they are seeing undoctored originals. PhotoShop, after all, is everywhere.

Criminal justice agencies have been slow to adopt new scientific procedures and defensive about evaluation of their present ones. The acceptance of DNA evidence and the standardization of laboratory procedures for DNA analysis eventually broke through that barrier, well after there was convincing scientific proof of their reliability. But resistance has remained firm in other areas. For example, polygraph testing for security purposes in the U.S. Department of Energy was carefully evaluated by the National Academies and found to be defective. The department rejected that recommendation and went on testing anyhow. And despite repeated calls for accreditation and oversight, many government crime labs continue to lack either one.

In the United States, the National Academies have a project on Science, Technology, and the Law, in which I'm involved. That group, which had earlier looked at the implications of the Daubert decision and a variety of other issues, was urged to examine science and its uses in forensic examination. A project plan was developed and approved, and one private foundation made a verbal prom-



Albert Godfrey, Registered PE, Long-Time State Traffic Safety Official, Favorite Prosecution Expert Witness, Testifying in a Vehicular Homicide Case Based on a Questionable Application of the Critical Speed Formula

The Court: *Mr. Godfrey, lets go back to some high school physics here just to complete the record. What is the scientific basis for the critical speed formula?*

Mr. Godfrey: *Newton's Laws.*

The Court: *Which is?*

Mr. Godfrey: *Well, there are three of them, three different laws.*

The Court: *Put them on the record, please.*

Mr. Godfrey: *You're pressing me, your Honor, here in my advanced senility.*

The Court: *I just want to complete the record.*

Mr. Godfrey: *There's three Newton's Laws. For every force there is an opposing force.*


The Court: *An object in motion stays in motion?*

Mr. Godfrey: *An object in motion tends to stay in motion. If it's in a circular motion, it will tend to move to the outside. **NOT!***

The Court: *And these are the basis of the mathematics of the formula?*

Mr. Godfrey: *These are the basics of the mathematics of the formula, yes, sir.*

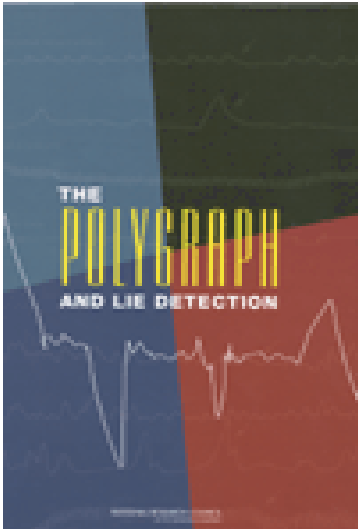
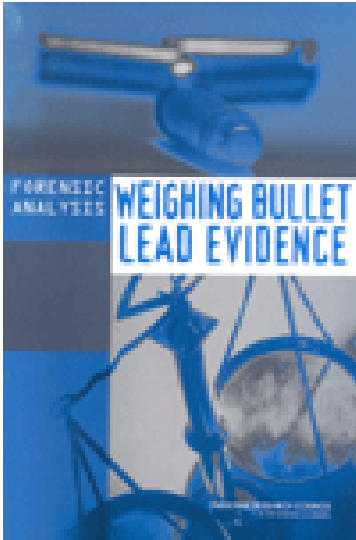
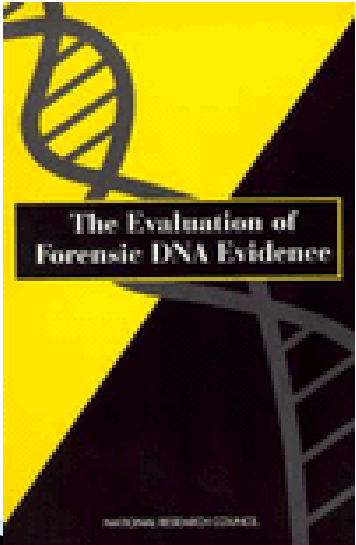
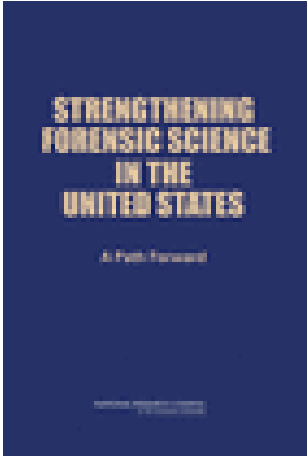
Factors Contributing to Unethical Behavior by Forensic Experts

- Ignorance of role
 - Pressure by contracting attorney
 - Incompetence
 - Reluctance to examine objectively one's theories and techniques
 - Belief that no disinterested knowledgeable person will ever become aware of one's testimony (*what happens in court stays in court*)
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Partial Solution to First Millstone: Take the Resolution of Scientific Disputes Outside the Adversarial System. Model: National Academy of Sciences Studies of Forensic Models and Theories



Partial Solution to First Millstone: Take the Scientific Questions out of the Adversarial System for Resolution, e.g., to the National Academy of Sciences



Partial Solution to Second Millstone: a. Amend FRCivP 26, including a Provision for Peer Review of Expert Reports

Rule 26, FRCivP

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(2) Disclosure of Expert Testimony.

(A) In General. In addition to the disclosures required by Rule 26(a)(1), a party must disclose to the other parties the identity of any witness it may use at trial to present evidence under Federal Rule of Evidence 702, 703, or 705.

(B) Written Report. Unless otherwise stipulated or ordered by the court, this disclosure must be accompanied by a written report — prepared and signed by the witness — if the witness is one retained or specially employed to provide expert testimony in the case or one whose duties as the party's employee regularly involve giving expert testimony. The report must contain:

- (i) a complete statement of all opinions the witness will express and the basis and reasons for them;
- (ii) the data or other information considered by the witness in forming them;

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(C) Time to Disclose Expert Testimony. A party must make these disclosures at the times and in the sequence that the court orders. Absent a stipulation or a court order, the disclosures must be made:

- (i) at least 90 days before the date set for trial or for the case to be ready for trial;
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Doctor Smith is expected to testify that the Defendant blew through the stop sign at 80 mph, causing the fatal crash. He bases his conclusions on his education and experience and his visit to the crash site and review of the records. His *CV* is attached.

Partial Solution for Second Millstone: b. Amend FRCrP 16 including Strengthening Requirement of Written Expert Report and Making Provision for Peer Review

(G) Expert Witnesses.

At the defendant's request, the government must give to the defendant a written summary of any testimony that the government intends to use under Rules 702, 703, or 705 of the Federal Rules of Evidence during its case-in-chief at trial. If the government requests discovery under subdivision (b)(1)(C)(ii) and the defendant complies, the government must, at the defendant's request, give to the defendant a written summary of testimony that the government intends to use under Rules 702, 703, or 705 of the Federal Rules of Evidence as evidence at trial on the issue of the defendant's mental condition. The summary provided under this subparagraph must describe the witness's opinions, the bases and reasons for those opinions, and the witness's qualifications. [Emphasis added.]