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**Admissibility of
Scientific Evidence and Expert Testimony:
One Potato, Two Potato, *Daubert*, *Frye***

**Maryland Judicial Institute
September 23, 2009**

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The goal of scientific research is to increase our knowledge. As knowledge grows, previously well-accepted theories are cast off and replaced by new theories, which in time may be refined or rejected. Though the world was once believed to be flat, we believe it to be rather round today. Newton's discovery of gravity still holds, so far. . . .

Expert testimony has been admitted in America since the 1600's; for example, a Dr. Brown gave "scientific" testimony at a heresy trial that the defendant had "bewitched" several persons.¹ How should trial judges filter which scientific and other expert evidence is admissible?

The applicable Maryland Rules, found in Title 5, are essentially the same as the corollary Federal Rules of Evidence.² The most salient difference in their application is that the Court of Appeals of Maryland continues to apply the "general acceptance" *Frye-Reed* standard to the admission of novel scientific evidence, while the federal courts, under *Daubert* ("Dow-burt") and its progeny use the *Frye* standard, when determining the admissibility of scientific evidence, as only one of several factors in a more flexible test evaluating relevance, reliability, and the relative helpfulness of all expert testimony (a Rules 401–702–403 test). This Rules 5-401–5-702–5-403 test is applicable in Maryland to all expert testimony not covered by *Frye-Reed*.

In either state or federal court, the first inquiry when any expert testimony is offered is, as with all evidence, is it relevant to the case?

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¹ Andre A. Moenssens & Fred E. Inbau, *Scientific Evidence in Criminal Cases* § 1.02 at 4 (2d ed. 1978) (citing Howell, *State Trials* 687 (1665)).

² This is especially true since Fed. R. Evid. 703 was amended in 2000 to follow an approach like that adopted in Md. Rule 5-703 in 1994.

I. **Overview of Rules Analysis: 5-401 Relevance/Other Rules/5-403 Discretion**

1. **Is the evidence relevant** (does it have even a slight tendency to prove or disprove a fact that is of consequence to the case, Md. Rule 5-401)?
→ No. Inadmissible.
Md. Rule 5-402.
↓
Yes.
↓
2. **Is the evidence excluded by constitution, statute, specific rule in Title 5 of the Md. Rules, or case law not inconsistent with Title 5?**
→ Yes. Inadmissible.
Md. Rule 5-402.
↓
No.
↓
3. **Should the trial court in its discretion exclude the evidence anyway, because the danger of its (1) causing unfair prejudice, or (2) confusing or misleading the jury, or (3) consuming too much time, *substantially* outweighs the probative value it adds to the case?**
→ Yes. Inadmissible.
Md. Rule 5-403.
↓
No.
Admissible.

As always, “the devil is in the details.” Here the “details” are in Step 2 above: all the Rules except 5-401, 5-402, and 5-403!

II. Lay Witness or Expert?

Is the witness a lay witness, an expert but a “fact witness,” or an expert witness for purposes of the discovery rules and the evidence rules?

Rule 5-403).
Note: These determinations as to
admissibility are all by the trial
judge under Md. Rule 5-104(a).

Testimony must be to
“Just the facts, ma’am.”

See vol. 6 LYNN MCLAIN, MARYLAND EVIDENCE: STATE AND FEDERAL §§ 701:1–701:7 (2d ed. 2001 & Supp. 2009) (accessible on Westlaw as, e.g., “6 Maryland Evidence 701:1”); JOSEPH F. MURPHY, JR., MARYLAND EVIDENCE HANDBOOK §§ 603–603(F) (2d ed. 1999) (accessible on LEXIS by clicking on “Find a Source” and typing in “Maryland Evidence Handbook”).

B. Witnesses with specialized knowledge may be called to testify either as fact witnesses or expert witnesses.

1. **Fact witnesses testify from first-hand knowledge to relevant facts in the case, and do not give expert opinions.** For example, if an arresting officer testifies to what he or she observed, the officer is merely a fact witness and Md. Rule 5-701 applies.

A fact witness may not testify to facts of which the witness has first-hand knowledge and then opine as to them – based on the witness’s expertise gained from “specialized knowledge, skill, experience, or education” – unless there has been compliance with the discovery rules regarding expert testimony. *Ragland v. State*, 385 Md. 706, 870 A.2d 609 (2005). *But see Matoumba v. State*, 390 Md. 544, 890 A.2d 288 (2006) (declining to apply *Ragland* holding to the testimony of a police officer in a suppression hearing).

2. **Expert witnesses may testify to their opinions, but are subject to special discovery and evidence rules.**

If the arresting officer testifies, for example, that the defendant swallowed “crack cocaine,” rather than “something that looked like crack cocaine,” the line has been crossed. *Robinson v. State*, 348 Md. 104, 115-28, 702 A.2d 1263 (1997).

3. **Necessity for expert testimony**

Sometimes expert testimony is required in order for a party to meet its burden of production of evidence so as to survive a motion for summary judgment or a directed verdict against it. E.g., *Wood v. Toyota Motor Corp.*, 134 Md. App. 512, 760 A.2d 315 (2000). See vol. 5 McLain § 300:7; Murphy §§ 1401–1402. Such an expert’s opinion generally must

be given to at least “a reasonable degree of probability.” *See, e.g., Impala Platinum Ltd. v. Impala Sales (U.S.A.), Inc.*, 283 Md. 296, 333, 389 A.2d 887, 908 (1978) (expert witness’s appraisal of present value of lost profits was within guidelines of reasonable certainty rule and was properly admitted in evidence).

“[W]here a complex and novel theory of science has been postulated,” the Court of Appeals has held that the courts ought look especially closely at admissibility, especially where “the area of expertise is central to the resolution of the lawsuit.” *Blackwell v. Wyeth*, 408 Md. 575, 627-29, 971 A.2d 235 (2009) (affirming trial court’s exclusion of plaintiffs’ proffered experts – (1) a medical doctor and a genetic counselor, (2) a chemistry professor, (3) a pharmacology professor, (4) a pediatrician, and (5) a forensic psychiatrist, as unqualified to testify to epidemiological matters: a causal link between a mercury derivative in vaccines given to an infant and his autism and mental retardation).

Questions

1. Police officer on narcotics squad is called to testify at trial that, based on his training and experience, what he observed: two telephone calls from separate pay phones, the movements of two vehicles, and something passing between them – was a drug transaction. This is:

- A. Lay testimony.
- B. Expert testimony.

Ragland v. State, 385 Md. 706, 870 A.2d 609 (2005).

2. A witness, a licensed driver who was on the highway at the time in question, testifies that she saw the civil defendant in an automobile tort case driving down the highway “at a very high rate of speed, tailgating, and weaving in and out of traffic.” The evidence is:

- A. Admissible.
- B. Inadmissible.

See Beahm v. Shortall, 279 Md. 321, 339-40, 368 A.2d 1005 (1977); *Lilly v. State*, 212 Md. 436, 444, 129 A.2d 839 (1957).

3. The same witness testifies that the defendant was “at least negligent and I think grossly negligent. He scared me to death.” The evidence is:

A. Admissible.

B. Inadmissible.

See Baltimore v. C&O Ry. v. Moon, 118 Md. 380, 391-92, 84 A. 536 (1912); *McCoy v. Hatmaker*, 135 Md. App. 693, 720-23, 763 A.2d 1283 (2000).

4. A buddy is called to testify that when he saw the DUI defendant leave the bar, the defendant was drunk.

A. Admissible.

B. Inadmissible.

Crampton v. State, 71 Md. App. 375, 388, 525 A.2d 1087 (1987), *aff'd on other grounds*, 314 Md. 265, 550 A.2d 693 (1998).

5. Police officer is asked by the prosecutor whether the officer believes the defendant is guilty. The evidence is:

A. Admissible.

B. Inadmissible.

Crawford v. State, 285 Md. 431, 404 A.2d 244 (1979).

6. Arresting police officer’s testimony that he smelled marijuana smoke is:

A. Admissible lay opinion, as long as witness is familiar with the smell of marijuana through past experience.

B. Inadmissible unless officer is qualified as an expert.

In re Ondrel M., 173 Md. App. 223, 228 & nn. 5-6, 238-45, 918 A.2d 543 (2007).

III. Expert Witnesses: Overview

If expert witness testimony is offered, it may be admitted if the court finds that it would be helpful to the trier of fact, which determination is based on three criteria under **Md. Rule 5-702**:

1. **Is the subject matter of the testimony appropriate?**
→ No. Inadmissible.
Md. Rule 5-702(2).
↓
Yes.
↓
2. **Is the particular witness qualified to testify on this subject?**
→ No. Inadmissible.
Md. Rule 5-702(1).
↓
Yes.
↓
3. **Is there a sufficient factual basis, in the case, to support the expert testimony?**
→ No. Inadmissible.
Md. Rule 5-702(3).
↓
Yes.
Admissible (subject to Md. Rule 5-403)

4. **What is the form that expert testimony may take?**

Form of testimony may be by opinion (Md. Rule 5-702), and the expert is not required to have first-hand knowledge of the underlying facts (Md. Rules 5-602 and 5-703). The fact that the opinion goes to an ultimate issue in the case does not necessarily exclude it, Md. Rule 5-704. **The question generally remains whether the particular opinion will assist the trier of fact, rather than be superfluous, unnecessary, or confusing. Md. Rule 5-702.**

See, e.g., Charles H. Steffey, Inc. v. High, 216 Md. 170, 173-74, 139 A.2d 730 (1958) (“[A] person who is qualified by study or experience, or both, to understand and explain the subject under consideration, may testify as to the manner in which a certain device or appliance operates. The test of admissibility of such testimony is whether it would probably aid the trier of fact to draw an accurate conclusion . . . from the facts

already in evidence”; State Roads employee was properly permitted to testify to operation of three phase traffic signal).

In criminal cases, there is a special caveat: experts permitted by statute, Md. Code Ann., Cts. & Jud. Proc. § 9-120, may testify on an ultimate issue of sanity (“criminal responsibility”) but otherwise may not state an opinion as to whether the defendant had a mental state or condition necessary for the charged crime. Md. Rule 5-704(b).

5. Must the expert first give a detailed basis for his or her opinion?

The court may permit the expert to testify to his or her opinion, and “reasons” for it, “without first testifying to the underlying facts or data,” Md. Rule 5-705, *as long as the court is satisfied that there is a sufficient factual basis for the opinion.* Md. Rule 5-702(3). (If the court has doubts on that point, it may require the expert to first testify to the underlying facts or data. Md. Rule 5-705.)

6. What if the underlying facts are inadmissible in evidence?

The expert may base his or her opinion on otherwise inadmissible hearsay, as long as it is shown to be “of a type reasonably relied upon by experts in the particular field informing opinions or inferences on the subject. . . .” Md. Rule 5-703(a).

Did the expert rely on otherwise inadmissible hearsay?

Yes.

Was it of a type reasonably relied on by experts in that field? (The court may require disclosure of that hearsay basis outside the hearing of the jury, see Md. Rule 5-104(c) (court “shall” do so when “the interests of justice” so require), so that the court may rule, under Md. Rule 5-104(a), on the admissibility of the opinion under Md. Rule 5-702.).

No. Opinion inadmissible.

Yes.
Opinion admissible (subject to
Md. Rule 5-403, and in criminal
cases, subject to the accused's
confrontation right).

7. Should an otherwise inadmissible hearsay basis be admitted on direct examination for the limited purpose of explaining the expert's opinion?

If the court finds that such basis is “[i] trustworthy, [ii] necessary to illuminate testimony, and [iii] unprivileged,” then it has the *discretion* to permit disclosure to the jury on direct. If it does so, then, upon request, the court shall give a limiting instruction to the jury “to use those facts and data only for the purpose of evaluating the validity and probative value of the expert’s opinion or inference.” Md. Rules 5-703(b); 5-105.

Regardless of whether the court permits such disclosure on direct, the opponent may freely cross-examine the expert regarding the basis of his or her opinion. Md. Rule 5-703(c).

See generally 6 McLain §§ 702:1–705:1; Murphy §§ 1404–1404(B)(1), 1407–1408(A).

IV. Qualifications of the Particular Witness as an Expert

Is the witness “qualified as an expert by knowledge, skill, experience, training, or education,” in the area as to which the proponent offers the witness as an expert?

—————→ No. Inadmissible.
Md. Rule 5-702(1).

↓
Yes.

See, e.g., Johnson v. State, 408 Md. 204, 223-25, 969 A.2d 262 (2009) (expert was qualified to testify about canine police work, but not about percentage of paper money that contains traces of illicit drugs).

Trial judge decides this question under Md. Rule 5-104(a). **Standard of appellate review: abuse of discretion, except that when standards for particular experts are established by statute, the trial court may not exclude such experts on the ground that they are unqualified.** *See In Re Adoption/Guardianship No. CCJ14746*, 360 Md. 634, 647, 759 A.2d 755 (2000) (trial court did not abuse its discretion in permitting a

certified clinical social worker to testify as to mental disorders; fact that a statute, Md. Cts. & Jud. Proc. Code Ann. § 9-120, expressly authorizes licensed psychologists to testify “merely limits the court’s discretion to deny a person in that class expert status for the purpose of testifying. When no such statute exists with regard to a person offered as an expert, however, the court has broad discretion to determine whether that person will be qualified as an expert or not.”) (citation omitted).

See generally 6 McLain § 702:4; Murphy §§ 602(B)(1), 1403–1403(A).

Question

7. An M.D. who practices internal medicine may not, as a matter of law, testify to his or her expert opinion as to gynecology.

- A. Correct.
B. Incorrect.

See Radman v. Harold, 279 Md. 167, 173, 367 A.2d 472 (1977). *Compare Ralston v. Smith & Nephew Richards, Inc.*, 275 F.3d 965, 968-70 (10th Cir. 2001) (because proffered testimony must pass *Daubert* analysis, mere possession of medical degree does not qualify a physician to testify concerning any medical-related issue).

V. Appropriateness of the Subject Matter of, and Sufficiency of Factual Basis for, Expert Opinion

- A. **Overview:** Helpfulness, Required Basis, and Reliability

Will the jury be in just as good a position to form an opinion as an expert would be?

No.

Is there a sufficient factual basis in the admissible evidence to make the expert opinion *relevant* to the case?

→ Yes. Expert opinion on that topic is inadmissible. The witness must “back up,” either to an opinion that *would* be helpful, or all the way to the facts. Md. Rules 5-702 and 5-704.

→ No. Inadmissible. Md. Rule 5-702(3).

See generally 5 McLain §§ 401:4 & 401:8; 6 McLain §§ 702:2–702:3; Murphy §§ 1406-1406(C).

Once a scientific principle is statutorily approved, judicially noticed, or found to meet the *Frye-Reed* standard, the results of the *tests* that rely on that principle will be admitted if three more prerequisites are met:

1. Any equipment necessary for performing the test was in working order;
2. The person operating the equipment or performing the test was qualified to do so;
and
3. That person did so properly.

Questions

8. A psychiatrist who interviewed the victim and has written extensively on child abuse is asked whether he believes the alleged sexual abuse victim's testimony. The evidence is:

- A. Admissible.
- B. Inadmissible.

See Bohnert v. State, 312 Md. 266, 277, 539 A.2d 657 (1988).

9. A police officer with significant training and experience in law enforcement regarding illicit drugs is called by the State to testify as to the street value of recovered drugs, how much an addict would purchase at a time, and that the amount of drugs was not for personal consumption.

- A. Admissible in the court's discretion.
- B. Inadmissible as a matter of law.

See Smiley v. State, 138 Md. App. 709, 719, 773 A.2d 606 (2001).

10. The accused has pled not criminally responsible. He calls a psychiatrist to testify that, based on his interview with the murder defendant, the defendant panicked when a robbery did not go as he planned and that he did not have the intent to murder.

- A. Admissible
- B. Inadmissible.

Hartless v. State, 327 Md. 558, 611 A.2d 581 (1992).

11. In the same case, the defense psychiatrist is called to testify to the defendant's "psychological profile," that he was under a tremendous amount of stress from his father. The defendant had not testified to (nor admitted other testimony to) his mental state. The trial judge excluded the evidence.

- A. Abuse of discretion to exclude.
- B. No abuse of discretion to exclude.

Hartless, 327 Md. at 574-81; *Waltermeyer v. State*, 60 Md. App. 69, 480 A.2d 831 (1984). See *State v. Smullen*, 380 Md. 233, 844 A.2d 429 (2004); *Beatty v. Trailmaster Products, Inc.*, 330 Md. 726, 625 A.2d 1005 (1993).

12. Psychiatrist testifies that murder defendant has a mental disorder, because he has experienced an amnesic episode. The opinion is:

- A. Admissible.
- B. Inadmissible.

Evans v. State, 322 Md. 24, 585 A.2d 204 (1991).

See *Rollins v. State*, 392 Md. 455, 497-509, 897 A.2d 821 (2006) (medical examiner's testimony had sufficient factual basis, including her microscopic examination of slides, her predecessor's findings as to the physical condition of the victim, the findings of the M.E.'s investigator, and the police reports); *City of Frederick v. Shankle*, 367 Md. 5, 15-16, 785 A.2d 749 (2001) (expert cannot testify in contradiction of legislative presumption that jury must consider, underlying police and firefighters workers' compensation statute); *Franch v. Ankney*, 341 Md. 350, 361-65, 670 A.2d 951 (1996) (no error in striking experts' testimony as lacking sufficient basis).

B. Reliability, Absent Statutory Recognition of Judicial Notice

1. *Frye-Reed* Still Good Law in Maryland

In a four-to-three decision in *Reed v. State*, 283 Md. 374, 391 A.2d 364 (1978), the Court of Appeals affirmed the exclusion of "voiceprint" evidence on the ground that it was not *generally accepted in the scientific community*. Judge Eldridge, writing for the majority, supported the court's decision to adopt the *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923) test on the following grounds:

(1) To admit evidence on which the scientific community disagrees would invite a confusing, time-consuming battle of the experts in each trial;

(2) Such a battle would require the fact finder to resolve a dispute which even the relevant scientific community could not resolve;

(3) Inconsistent results would no doubt occur;

(4) Those could cause verdicts at odds with each other, solely because one fact-finder gave credence to a scientific principle and another did not, when, in fact, the principle was either universally true or not; and

(5) The fact-finder might be tempted to give undue weight to any so-called “scientific” evidence. This temptation might be especially great when the scientific evidence, like that of the voiceprint in *Reed*, is offered scientifically to identify the perpetrator of the crime for which the defendant is being tried.

In light of the desire for consistency, **there is no presumption of correctness of a trial court’s finding of general acceptance under the *Frye-Reed* standard**; the question on appeal is merely whether the trial court’s finding is “against the weight of the evidence rather than whether it is clearly erroneous.” *Cobey v. State*, 73 Md. App. 233, 239, 533 A.2d 944 (1987). In reviewing the trial court’s decision, “the appellate court may consider evidence which was not presented to the trial court.” *Id.*

Judge Smith, joined by Chief Judge Robert Murphy and Judge Orth, dissented in *Reed*. The dissenters would have admitted the voiceprint evidence and let any dispute about its validity go to its weight. In an approach prescient of *Daubert*, they argued that the court should require only that scientific evidence have “reasonable reliability,” rather than general acceptance. The dissent argued:

(1) Maryland had not followed the 1923 *Frye* case before 1978;

(2) The *Frye* standard would exclude a great deal of probative scientific evidence; its application might cause the judicial system to lag years or decades behind scientific advances;

(3) The *Frye* standard developed in a case involving polygraphs, which pose special problems;

(4) Courts admit much evidence that is of questionable reliability, including eyewitness testimony and voice identifications by lay witnesses, without imposing such a high standard;

(5) The *Frye* standard does not give juries enough credit for being able to weigh scientific evidence, which can be attacked on cross-examination; and

(6) The *Frye* standard is unclear about how the proof it requires may be produced. For example, there can be a problem in the determination of **what is the relevant scientific community under *Frye***. Those who study a new field – such as voiceprints – and are in its forefront are sometimes discredited by the courts as having too much of a personal stake in the process' validity. But those in related fields – such as physiology, anatomy, and acoustical sciences – may be unlikely to know enough to make an informed judgment.

When it adopted Title 5, the Court of Appeals left to development through the case law whether it would continue to adhere to *Frye-Reed* or whether it might jettison that standard in favor of the then recent *Daubert* approach. Md. Rule 5-702, Committee Note. Since then it has reaffirmed its loyalty to *Frye*. *E.g.*, *Blackwell v. Wyeth*, 408 Md. 575, 971 A.2d 235 (2009). Maryland is not alone in its fealty to *Frye*. Several other states, including Arizona, California, Florida, and Washington, have reaffirmed *Frye* post-*Daubert*.³

The Court of Appeals has explained the application of *Frye* as follows:

A trial court may take judicial notice of the reliability of scientific techniques and methodologies that are widely accepted within the scientific community. A trial court also may take notice that certain scientific theories are viewed as unreliable, bogus, or experimental. However, when it is unclear whether the scientific community accepts the scientific

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³ *But see* Note, *Codifying Expert Testimony in Maryland Rules 5-702 and 5-703: Why Traditional Analysis Should be Generally Acceptable*, 54 MD. L. REV. 1085 (1995) (urging Maryland's adoption of *Daubert* approach).

theory or methodology, we have noted that before testimony based on the questioned technique may be admitted into evidence, the reliability must be demonstrated. While the most common practice will include witness testimony, a court may take judicial notice of journal articles from reliable sources and other publications which may shed light on the degree of acceptance *vel non* [or not] by recognized experts of a particular process or view. **The opinion of an “expert” witness should be admitted only if the court finds that “the basis of the opinion is generally accepted as reliable within the expert’s particular scientific field.”**

Montgomery Mut. Ins. Co. v. Chesson, 399 Md. 314, 327, 923 A.2d 939 (2007) (citations omitted).

But the continued allegiance to *Frye* does not end the inquiry. Maryland’s appellate courts have not applied *Frye-Reed* to all expert testimony, or even to all scientific evidence.

2. The \$64,000 Question: **When Does *Frye* Apply?**

a. ***Frye-Reed* Applies to the Validity of Scientific Theories, Tests, and Techniques**

A *Frye-Reed* showing must be made as to evidence based on a “novel theory of science,” *Blackwell v. Wyeth*, 408 Md. at 627, **or a “novel scientific method.”** *Montgomery Mut. Ins. Co.*, 399 Md. at 327 (“Under the *Frye-Reed* test, a party must establish first that any novel scientific method is reliable and accepted generally in the scientific community before the court will admit expert testimony based upon the application of the questioned scientific technique.”).⁴

i. **If the theory or method underlying an expert’s opinion has been generally accepted,** *see State v. Baby*, 404 Md. 220, 266-71, 946 A.2d 463 (2008) (the testimony regarding “rape trauma syndrome” must pass the *Frye-Reed* test as to the reliability of the underlying theory); *Montgomery Mut. Ins. Co.*, 399 Md. at 326-34 (remanding for a *Frye-Reed*

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⁴ *But see Blackwell v. Wyeth*, 408 Md. at 577 n.1 (overstating the proposition as “*Frye-Reed* is the test in Maryland for determining whether expert testimony is admissible.”).

hearing, to be held before trial and outside the presence of the jury; if plaintiff's doctor expert witness's testimony, "based on scientific opinion regarding the causal link between mold exposure and sick building syndrome" does not satisfy *Frye-Reed*, the judgment must be vacated), **then the opinion itself need not meet that test: experts may testify to different opinions.** *Giddens v. State*, 148 Md. App. 407, 415-17, 812 A.2d 1075 (2002) ("The *Frye-Reed* test applies to methodologies, not the conclusions drawn from applying the methodologies. . . . It is . . . well settled . . . that if the relevant scientific community is in general agreement that a properly conducted scientific test will produce an accurate result, the *Frye-Reed* test does not operate to exclude conflicting expert opinions based upon such a test. Because expert pathologists do agree that a properly conducted autopsy will reveal lack of swelling in the victim's brain and spinal cord, nothing in *Frye, Reed* or *Wilson* requires the exclusion of Dr. Pestaner's 'time of injury' opinion based upon that autopsy finding."); *Owens Corning v. Bauman*, 125 Md. App. 454, 726 A.2d 745 (1999) (trial court properly permitted pulmonary pathologist to testify; *Frye-Reed* test did not apply to his testimony, which was not based on novel techniques or tests), as modified on clarification, (Apr. 7, 1999).

ii. But the court must conduct a *Frye-Reed* hearing if the expert is proposing a novel theory, even one based on his or her own observations, experience, and study.

In *Blackwell v. Wyeth*, 408 Md. 575 (2009), the plaintiffs brought suit alleging that their child's autism and mental retardation were caused by vaccinations containing the preservative thimerosal (an ethyl mercury derivative) that he received as an infant. Circuit Court Judge Berger entered summary judgment for the defendants upon concluding that the plaintiffs had failed to show that their experts' opinions as to causation, and the underlying analysis, met *Frye-Reed*. The Court of Appeals, in an extensive, unanimous opinion by Judge Battaglia, affirmed. **It reviewed (1) *de novo* the legal question of admissibility under *Frye-Reed*, and (2) the exclusion of the plaintiffs' experts as unqualified, under the more deferential standard of abuse of discretion.**

Judge Battaglia characterized the first question as involving “the application of the *Frye-Reed* test to the analysis undertaken by an expert where the underlying data and methods of gathering this data are generally accepted in the scientific community but applied to support a novel theory.” She reviewed numerous well-respected studies which Circuit Court Judge Berger had reviewed, that had concluded that the scientific evidence to date shows no link between thimerosal and autism.

The plaintiffs’ principal expert and his son had conducted the only studies showing such a link “in a small number of genetically susceptible individuals.” But the methodology of their studies had been criticized by the American Academy of Pediatrics and the National Academy of Sciences’ Institute of Medicine. In reevaluating the trial court’s resolution of the *Frye-Reed* issue, the Court of Appeals explicitly borrowed from the “reliability” analysis of the federal courts (although the federal courts had applied *Daubert*). Following their reasoning, the Maryland court held that “[g]enerally accepted methodology must be coupled with generally accepted analysis,” so that expert opinion based on “‘too great a leap’ ” must be excluded.

b. Lack of Uniformity; Some Earlier Language Has Been Rejected

When to apply *Frye* has proved troublesome for every *Frye* jurisdiction, and no clear, uniform standard has emerged. See, e.g., *Logerquist v. McVey*, 1 P.3d 113 (Ariz. 2000) (vacating trial court’s order excluding plaintiff’s expert’s testimony regarding sexual abuse victim’s repressed memory; *Frye* is inapplicable: “ ‘Although compliance with *Frye* is necessary when the scientist reaches a conclusion by applying a scientific theory or process based on the work or discovery of others, under Rules 702 and 703 experts may testify concerning their own experimentation and observation and opinions based on their own work without first showing general acceptance. Such evidence need only meet the traditional requirements of relevance and avoid substantial prejudice, confusion, or waste of time.’ ”). Compare *Marsh v. Valyou*, 977 So. 2d 543 (Fla. 2007) (per curiam) (*Frye* does not apply to a medical expert’s “pure opinion” testimony regarding

causal link between trauma and fibromyalgia, but even if *Frye* did apply, it was satisfied by the testifying expert) *with, e.g., Ramirez v. State*, 810 So. 2d 836 (Fla. 2001) (procedure for identification of knife marks failed *Frye* test).

Maryland's Court of Appeals decisions in *Blackwell v. Wyeth* and *Montgomery Mutual Ins. Co.* attempt to resolve confusion engendered by earlier appellate decisions, most notably *State v. Allewalt*, 308 Md. 89, 98, 517 A.2d 741 (1986), where the Court of Appeals held that *Frye-Reed* did not apply to the admissibility of expert testimony that an alleged rape victim suffered from post-traumatic stress disorder (PTSD), when offered to rebut a defense of consent. The *Allewalt* majority states:

The analysis by the Court of Special Appeals erects an unreasonably high standard for the admissibility of medical opinion evidence. **The analysis also mischaracterizes the evidence in this case as if the medical opinion had been presented as a scientific test the results of which were controlled by inexorably physical laws.** Further, the analysis ignores [the psychiatrist's] opinion that, based on the history [given him by the victim], the stressor causing PTSD in [the victim] following June 25, 1983, was what she said was a rape occurring on that day.

Allewalt was followed by *Myers v. Celotex Corp.*, 88 Md. App. 442, 594 A.2d 1248 (1991), where the Court of Special Appeals held that the trial court committed reversible error in applying the *Frye-Reed* standard to a doctor's opinion testimony as to how asbestos directly causes cancer. The appellate court held that the doctor should have been permitted to testify, when he testified his *opinion* rose to a "reasonable medical probability," "even though he could not state that the theory he espoused was generally accepted by the medical community." It reasoned that the *Frye* doctrine did not apply, because the doctor was not testifying as to "the validity of a new scientific technique" such as lie detector tests, breathalyzer tests, or paraffin tests. *Myers* relied on *Allewalt* to hold that *Frye-Reed* does not extend " 'to medical opinion evidence which is not presented as a scientific test the results of which were controlled by inexorable, physical laws.' "

Again, in *CSX v. Miller*, 159 Md. App. 123, 858 A.2d 1025 (2004) the Court of Special Appeals relied on *Myers* to find *Frye-*

Reed inapplicable to a medical opinion regarding the etiology of a workers' compensation claimant's osteoarthritis.

In *Montgomery Mutual Ins. Co.*, Judge Raker distinguished *Allewalt*, *CSX*, and *Myers* from the case before the court:

The instant case differs from both *CSX* and *Myers*. It involves more than a generally accepted medical opinion and diagnosis. Dr. Shoemaker employs medical tests to reach a conclusion [regarding toxic mold and sick building syndrome] that is not so widely accepted as to be subject to judicial notice of reliability. Further, as we noted in *Reed*, novel medical theories regarding the causes of medical conditions have been subject to *Frye* analysis. *Reed*, 283 Md. At 383, 391 A.2d at 369 (noting that the *Frye* test had been applied to “medical testimony regarding the cause of birth defects”).

399 Md. At 332-33 (footnote omitted). She pointed out that in *Allewalt* there was “ ‘no issue . . . over the fact that psychiatrists and psychologists recognize PTSD [post-traumatic stress disorder] as an anxiety disorder.’ ” *Id.* At 332. Judge Battaglia, writing for the court in *Blackwell v. Wyeth*, reiterated this distinction.

The language in *Allewalt* regarding *Frye-Reed* has been distinguished to extinction.

c. Other Maryland Cases Regarding Application of *Frye-Reed*

i. Brands of Devices Used to Apply Established Principles, No

Frye-Reed was held inapplicable to the accuracy of particular products or devices used to apply established scientific principles. *Goldstein v. State*, 339 Md. 563, 573, 664 A.2d 375 (1995). The defense “conceded that the use of lasers to measure speed is generally accepted within the relevant scientific community.” The Court of Appeals held that the design of the particular gun used to measure speed of defendant’s motor vehicle – rather than the underlying theory – was not subject to *Frye-Reed*.

ii. DNA Evidence: RFLP, No; PCR, Yes

(a) *RFLP (Restriction Fragment Length Polymorphism)*

Md. Code Ann., Cts. & Jud. Proc. § 10-915(c) makes DNA evidence collected using the RFLP technique admissible, so that generalized challenges to its admissibility are precluded.

Armstead v. State, 342 Md. 38, 673 A.2d 221 (1996) (over dissent of Bell, J.). The statute also makes admissible expert testimony to statistics showing the odds of a random match (in *Armstead*, 1 in 480,000,000 and 1 in 800,000, respectively), under either the “product rule” or the “ceiling principle” method. *See, e.g., Wilson v. State*, 132 Md. App. 510, 523, 752 A.2d 1250 (2000).⁵

RFLP DNA evidence may be excluded only if it is irrelevant, or if case-specific defects in the testing procedure make particular results unhelpful. The trial judge must permit the defense to cross-examine a State’s DNA expert about testing errors and incidents of contamination at the lab in question. *Williams v. State*, 342 Md. 724, 744-52, 679 A.2d 1106 (1996) (reversible error to restrict that line of questioning).

The statute does not preclude a trial judge from excluding evidence of a DNA profile if the court concludes that the laboratory in question did not follow proper procedures, so that the test results are unhelpful. A procedure like the following, endorsed by several federal courts of appeals, seems appropriate (except that the Maryland statute obviates the need for taking judicial notice):

[I]n future cases . . . , a court could properly take judicial notice of the general

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⁵ *But see* Weinstein, *Rule 702 of the Federal Rules of Evidence is Sound; It Should Not Be Amended*, 138 F.R.D. 631, 644-45 (advocating giving a much more conservative figure as to the probability of a non-match than has been given in some cases, or using “a phrase such as ‘very highly probable,’ without quantification”).

acceptability of the general theory and the use of these specific [DNA] techniques. Beyond such judicial notice [in Maryland, statutory recognition], the threshold for admissibility should require only a preliminary showing of reliability of the particular data to be offered, i.e., some indication of how the laboratory work was done and what analysis and assumptions underlie the probability calculations. The probability data may well vary among different segments of the population. Affidavits should normally suffice to provide a sufficient basis for admissibility. DNA profiling evidence should be excluded only when the government cannot show this threshold level of reliability in its data. The district court should focus on whether accepted protocol was adequately followed in a specific case, but the court, in exercising its discretion, should be mindful that this issue should go more to the weight than to the admissibility of the evidence. Rarely should such a factual determination be excluded from jury consideration. With adequate cautionary instructions from the trial judge, vigorous cross-examination of the government's experts, and challenging testimony from defense experts, the jury should be allowed to make its own factual determination as to whether the evidence is reliable.

United States v. Jakobetz, 955 F.2d 786, 791-800 (2d Cir. 1992). Accord *United States v. Martinez*, 3 F.3d 1191 (8th Cir. 1993) (post-*Daubert*). See *United States v. Beasley*, 102 F.3d 1440, 1448 (8th Cir. 1996) (laboratory error may form the basis of evidence exclusion only when a reliable methodology was so altered by the laboratory as to skew the methodology itself) (cited with approval in *United States v. Davis*, 602 F.Supp.2d 658, 664 (D. Md. 2009).

(b) PCR (Polymerase Chain Reaction)

DNA testing using the PCR technique or any non-RFLP technique must be evaluated under *Frye-Reed*. *Armstead; Wagner v. State*, 160 Md. App. 531, 542-52, 864 A.2d 1037 (2005) (no error in finding that **mitochondrial DNA (mt DNA) met *Frye-Reed* test**; potential for contamination went only to weight of the evidence and did not make it inadmissible); *Chase v. State*, 120 Md. App. 141, 153, 706 A.2d 613 (1998) (**PCR evidence passed *Frye-Reed* test**). See *United States v. Davis*, 602 F.Supp.2d 658 (D. Md. 2009) (DNA evidence based on PCR, which generally requires sample of at least 100 picograms, is generally accepted as reliable).

(c) Need for Contextual Statements

In light of the advances made in DNA analysis since *Armstead* was decided in 1996, the Court of Appeals held in 2005 that **“when a DNA method [here PCR]⁶ analyzes genetic markers at sufficient locations to arrive at an infinitesimal random match probability, expert opinion testimony of a match and of the source of the DNA evidence is admissible,”** *Young v. State*, 388 Md. 99, 100, 879 A.2d 44 (2005), and **“the expert is not required to accompany his ‘match’ testimony with contextual statistics.”** *Id.* at 105. In *Young*, the trial court had committed no error in admitting expert testimony, following an analysis of 13 loci, that to “a reasonable degree of scientific certainty (in the absence of an identical twin)” the defendant was the source of the analyzed DNA. *Id.* at 103. Judge Raker, writing for a unanimous court, noted, however, that if the accused has a close relative, “typically” a sibling, “who could have been

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⁶ Although *Young* involved PCR evidence, the defendant did not challenge its admission on the ground that it failed *Frye-Reed* nor did the Court of Appeals address that issue. 388 Md. at 108 n.6.

the source of the DNA evidence,” because he or she is “in the pool of potential contributors of crime scene evidence,” then “the expert’s caveat should take into account the higher random match probability for close relatives, not only identical twins.” *Id.* at 120 n.12.

iii. Dog Tracking In, But Does *Frye* Apply?

Compare Clark v. State, 140 Md. App. 540, 578-79, 781 A.2d 913 (2001) (tracking by adequately trained dogs meets *Frye-Reed*) with *State v. Roscoe*, 700 P.2d 1312, 1319-20 (Ariz. 1984) (evidence admissible, but *Frye* inapplicable, as evidence “was not bottomed on any scientific theory”). See *Johnson v. State*, 408 Md. 204, 223 & n.5, 969 A.2d 262 (2009) (evidence that dog trained to find drugs alerted to defendant’s pants was properly admitted) (not mentioning *Frye-Reed*).

iv. PIP Statute: *Frye* Does Not Apply

The Court of Appeals has held that PIP (Personal Injury Protection) benefits should be available if medical techniques are shown to have “efficacious material value . . . as a diagnostic aid”; agreement by a majority of the medical or academic community is not required). *Sabatier v. State Farm Mut. Auto. Ins. Co.*, 323 Md. 232, 592 A.2d 1098 (1991).

v. Repressed Memory: Yes, *Frye* Applies

The Court of Appeals used the *Frye-Reed* test in concluding that “repressed memory” was insufficiently distinguishable from mere forgetting so as to toll an otherwise applicable statute of limitations. *Doe v. Maskell*, 342 Md. 684, 694, 679 A.2d 1087 (1996) (“While the existence of consensus (or lack thereof) in the scientific community is a more familiar inquiry within the context of determining the admissibility of scientific evidence under the test enunciated in *Reed*, it is also a useful measure for this court to evaluate the acceptance, and acceptability of a scientific theory.”).

Questions

13. A clinical social worker wishes to testify that an alleged victim of child sexual abuse is suffering from Post-Traumatic Stress Disorder (PTSD) as a result of being sexual abused. Is the evidence of PTSD subject to *Frye-Reed*?

A. Yes.

B. No.

See Hutton v. State, 339 Md. 480, 495 n.10, 663 A.2d 1289 (1995).

14. In 13., may the psychiatrist testify to her conclusion that the victim was sexually abused and was not “faking” her symptoms?

A. Yes.

B. No.

Hutton. See Hall v. State, 107 Md. App. 684, 670 A.2d 962 (1996).

See also, e.g., United States v. Betcher, 534 F.3d 820, 825-26 (8th Cir. 2008), cert. denied, 129 S.Ct. 962 (U.S. 2009) (no abuse of discretion to admit child abuse expert’s testimony regarding age-appropriate sexual behavior, delayed reporting, and child pornography as a form of child abuse).

15. To impeach the victim’s identification, a psychologist is called by the criminal defendant to testify to the frailties of eyewitness identification, particularly cross-racial identification. The defendant is well known to the victim, and there is physical evidence placing the defendant at the crime scene. Is the evidence subject to *Frye-Reed*?

A. Yes.

B. No.

Bloodsworth v. State, 307 Md. 164, 184 (512 A.2d 1056 (1986).

16. In 15., would you admit the evidence?

A. Yes.

B. No.

See Bomas v. State, 181 Md. App. 204, 956 A.2d 215 (2008), cert. granted, 406 Md. 743, 962 A.2d 370 (2008) (if *Bloodsworth*'s test is to be altered, it must be by the Court of Appeals; in instant case, no abuse of discretion in excluding defense expert's testimony regarding memory curve and eyewitness identification, where court found expert's opinion not helpful regarding particular police witness); *Thompson v. State*, 167 Md. App. 513, 526-27, 893 A.2d 1169 (2006).

3. The \$128,000 Question: **What Standard for Expert Testimony Applies in Maryland When *Frye* Does Not Apply?**

a. ***Daubert* (a/k/a 401–702–403)**

In 1993 the United States Supreme Court decided *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993) in which it held that the Federal Rules of Evidence superseded *Frye* with regard to the admission of scientific evidence. The Court set forth a number of criteria that a trial court ought consider in exercising its **gatekeeping function** to exclude unreliable, “junk science” so as to admit only reliable expert testimony on scientific matters. In its 1999 decision in *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999), the Court made clear that this responsibility of the district court applies equally to all proffered expert testimony, including opinions on non-scientific matters, “technical” matters, or “other specialized knowledge.”

i. *Federal Cases Pre-Daubert*

Prior to *Daubert*, the federal courts were divided as to what standard applied with regard to proof of reliability of the principle or technique underlying scientific evidence, if judicial notice of that principle or technique was inappropriate. Some adhered to the *Frye* test. Others had rejected the *Frye* test in favor of an *ad hoc* Fed. R. Evid. 401–702–403 balancing. *E.g.*, *United States v. Baller*, 519 F.2d 463 (4th Cir. 1975) (“Unless an exaggerated popular opinion of the accuracy of a particular technique makes its use prejudicial or likely to mislead the jury, it is better to admit relevant scientific evidence in the same manner as other expert testimony and allow its weight to be attacked by cross-examination and refutation.”). These latter courts applied **the general relevance standard of Fed. R. Evid. 401, coupled with Fed. R. Evid. 702's admonition that any expert testimony must be helpful to the trier of fact.**

Then the trial court must consider Fed. R. Evid. 403: if the helpful, probative value of the evidence is substantially outweighed by the considerations of unfair prejudice, confusion of the issues, misleading or distraction of the trier of fact, or waste of time, the trial court, in its discretion, should exclude the evidence.

ii. *Daubert*

In *Daubert* the United States Supreme Court joined this 401–702–403 camp. The Court held that the Federal Rules of Evidence rejected *Frye*, although the degree of acceptance of a particular method or test within the scientific community remains a relevant factor for the trial court to consider in performance of its limited “gatekeeping role” to keep out junk science. The Court declined to set forth a “definitive” test for the admission of novel scientific evidence pursuant to its “**reliability approach**,” 509 U.S. at 595 n.12, but offered the following “general observations.”

Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested. * * * Another pertinent consideration is whether the theory or technique has been subjected to peer review and publication. Publication (which is but one element of peer review) is not a *sine qua non* of admissibility. . . . * * * Additionally, in the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error. . . . Finally, “general acceptance” can yet have a bearing on the inquiry. A “reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community.” Widespread acceptance can be an important factor in ruling particular evidence admissible, and “a known technique that has been able to attract only minimal support within the community,” may properly be viewed with skepticism.

Id. at 593-94.

The *Daubert/Kumho Tire* 401–702–403 approach is **more flexible** and, on its face, more liberal than *Frye*, as the *Daubert* Court relies not on a strict rule of preclusion of evidence, but on “the adversary system”: “Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.” *Id.* at 596.

Yet it does not permit the introduction of evidence unless the supporting proof suffices “to allow a reasonable juror to conclude that the position [taken] more likely than not is true. . . .” *Id.* For example, on remand the *Daubert* court reached the same conclusion it had reached when it erroneously had applied *Frye*: it found the plaintiff’s proffered evidence that Bendectin, an anti-nausea drug prescribed during pregnancy, had caused severe birth defects, and again granted defendants’ motion for summary judgment.

The flexibility of the *Daubert* test also could permit a court to exclude scientific evidence that while still “generally accepted,” has begun to be proved unreliable. All in all, *Daubert* has engendered thorough pretrial vetting by federal judges of proffered expert testimony in every field. As explained by the United States Court of Appeals for the Fourth Circuit:

A district court considering the admissibility of expert testimony exercises a gate keeping function to assess whether the proffered evidence is sufficiently reliable and relevant. The inquiry to be undertaken by the district court is “a flexible one” focusing on the “principles and methodology” employed by the expert, not on the conclusions reached. In making its initial determination of whether proffered testimony is sufficiently reliable, the court has broad latitude to consider whatever factors bearing on validity that the court finds to be useful; the particular factors will depend upon the unique circumstances of the

expert testimony involved. The court, however, should be conscious of two guiding, and sometimes competing, principles. **On the one hand, the court should be mindful that Rule 702 was intended to liberalize the introduction of relevant expert evidence. And, the court need not determine that the expert testimony a litigant seeks to offer into evidence is irrefutable or certainly correct.** As with all other admissible evidence, expert testimony is subject to being tested by “[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof.” **On the other hand, the court must recognize that due to the difficulty of evaluating their testimony, expert witnesses have the potential to “be both powerful and quite misleading.”** And, given the potential persuasiveness of expert testimony, proffered evidence that has a greater potential to mislead than to enlighten should be excluded.

Westberry v. Gislaved Gummi AB, 178 F.3d 257, 261 (4th Cir. 1999) (no error in admitting doctor’s testimony) (citations and footnote omitted).

The specific factors listed in *Daubert* may not always be useful to the relevance-reliability-unfair prejudice analysis. See *First Tennessee Bank Nat’l Ass’n v. Barreto*, 268 F.3d 319, 331-35 (6th Cir. 2001) (“[W]e find the *Daubert* reliability factors unhelpful in the present case, which involves expert testimony derived largely from Iorlano’s own practical experiences throughout forty years in the banking industry.”).

b. When *Frye* Does Not Apply, Maryland Essentially Follows *Daubert* (5-401 Relevance – 5-702 Reliability – 5-403 Discretion)

See generally Edward J. Imwinkelreid, *The Importance of Daubert in Frye Jurisdictions*, 42 CRIM. L. BULL. 215, 218 (2006) (“[A]lthough its judicial adherents tout *Frye* as a rigorous, conservative admissibility standard, the standard is severely cabined and applies to only a limited range of expert testimony.

The proponent of expert evidence can escape *Frye* scrutiny if he or she can convince the trial judge that: (1) the expert is relying on a traditional theory or technique; (2) the expert is offering soft scientific testimony; or (3) the witness's expertise is non-scientific in character. If the trial judge finds that any of these contentions applies in the pending case, the judge will not subject the expert's testimony to the general acceptance test.).

4. **Just Curious: Even When *Frye* Applies, Are the Results Different under *Daubert*?**

The answer is sometimes, but certainly not always. One would expect to find less consistency among *Daubert* cases on the same topic as there is in a *Frye* jurisdiction. But when there is disagreement among the scientific community, there generally will be disagreement emerging under either *Daubert* or *Frye*. Some examples of comparisons follow.

a. **Ballistics and Bullets: Comparative Bullet Lead Analysis (CBLA): Maryland Out under *Frye*, Federal In under *Daubert***

i. *Background*

In September 2005 the F.B.I. announced it had stopped performing CBLA for economic reasons but said it “still firmly supports the scientific foundation” of CBLA, the reliability of which a National Academy of Sciences report had questioned. Julie Bykowicz, *FBI Lab Scraps Gunfire Residue*, THE BALT. SUN, 1A, col. 6, May 26, 2006.

ii. *Maryland*

See Clemons v. State, 392 Md. 339, 896 A.2d 1059 (2006) (reversible error to admit testimony concerning CBLA of bullets fired at victim and bullets recovered during traffic stop of defendant; CBLA does not pass *Frye-Reed*, as “a genuine controversy [now] exists within the relevant scientific community about the reliability and validity of CBLA”).

iii. *Federal*

United States v. Mikos, 539 F.3d 706, 710-12 (7th

Cir. 2008) (no abuse of discretion in permitting FBI ballistics agent to testify to CBLA), *aff'g* 2003 WL 22922197 (N.D. Ill. 2003).

See also United States v. Hicks, 389 F.3d 514, 525-26 (5th Cir. 2004) (widespread acceptance by federal courts of firearms comparison testing, here of spent shell casings with known weapon); *United States v. Foster*, 300 F.Supp.2d 375 (D. Md. 2004) (FBI examiner's comparison of spent cartridge casings from two murders, when no known weapon found, admissible). But see *infra* V.B.4.c.iii, pp. 34-35 (cases limiting testimony as to certainty of match).

b. Field Sobriety Tests: HGN Passes *Frye*, But Fails *Daubert*

i. Maryland: HGN (Horizontal Gaze Nystagmus Test for Intoxication) Passes Frye

State v. Blackwell, 408 Md. 677, 971 A.2d 296 (2009) (HGN test, unlike other field sobriety tests, is a scientific test; reversible error to permit trooper who administered it to motorist without *expressly* ruling trooper to be an expert) (over well-reasoned dissent of Murphy, J., regarding need for express ruling); *Schultz v. State*, 106 Md. App. 145, 164-65, 664 A.2d 60 (1995) (HGN test is a scientific test and meets *Frye-Reed*). *But cf. Crampton v. State*, 71 Md. App. 375, 386-88, 525 A.2d 1087 (1987) (“The *Frye-Reed* test does not apply to . . . field sobriety tests [the one-leg stand; heel-to-toe; and recitation of alphabet given by police officers] because the latter are essentially empirical observations, involving no controversial, new, or ‘scientific’ technique. Their use is guided by practical experience, not theory.”), *aff'd on other ground*, 314 Md. 265, 550 A.2d 693 (1988).

ii. Federal: HGN fails Daubert

United States v. Horn, 185 F.Supp.2d 530 (D. Md. 2002) (*Daubert* applies; arresting officer could not refer, at trial on merits (as opposed to probable cause issue) to field sobriety tests—“walk and turn,” “one leg stand,” and “horizontal gaze nystagmus”—as tests, as they fail to meet

Daubert standards when offered to prove blood alcohol content; officer could testify to observations; “In so doing, however, the officer may not use value-added descriptive language to characterize the subject’s performance of the SFSTs, such as saying that the subject ‘failed the test’ or ‘exhibited’ a certain number of ‘standardized clues’ during the test”). See *United States v. Van Hazel*, 468 F.Supp.2d 792, 795-97 (E.D.N.C. 2007) (rejecting *Horn*’s reasoning but excluding results altogether of HGN test, as a “scientific test” which required evidence of test’s reliability, judicial notice being inappropriate).

c. Fingerprint Evidence: In Flux?

i. National Academy of Sciences Report

A 2009 National Academy of Sciences’ National Research Council report has fueled the attack on admissibility of all forensic evidence, such as fingerprints, hair analysis, bite marks, and handwriting analysis, other than DNA, when used to identify an individual as well as weapons’ tool marks. NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD S-17 (Prepublication Copy Feb. 2009) (“[B]ecause forensic scientists often are driven in their work by a need to answer a particular question related to the issues of a particular case, they sometimes face pressure to sacrifice appropriate methodology for the sake of expediency.”) (cited in *Melendez-Diaz v. Massachusetts*, 129 S.Ct. 2527 (U.S. Jun. 25, 2009)).

ii. Maryland

In *Murphy v. State*, 184 Md. 70, 86, 40 A.2d 239 (1944), the Court of Appeals took “judicial notice of the fact that the use of fingerprints is an infallible means of identification.”

More recently, the reliability of identification based on partial or “latent” prints has been questioned. Attracting national attention, Baltimore County Circuit Court Judge Susan M. Souder ruled in October 2007 that the

prosecution's experts could not testify at all regarding the ACE-V methodology when applied to partial "latent" prints. *State v. Rose* (No. K06-0545) (Balt. Co. Cir. Ct., Oct. 19, 2007). In light of the proven occurrence of "false positives" in other cases, Judge Souder found that the State expert's proffered testimony, that "there is no error rate for ACE-V" and that he was 100% certain that the latent prints were the defendant's was "not credible" and his entire testimony was inadmissible (though she demurred that, because "ACE-V methodology is changing," ACE-V evidence might be admissible in the future). *Id.* at 25. She seemed to apply a *Daubert* analysis rather than *Frye-Reed*, as she did not specifically find that the defense had proven that latent fingerprint analysis had lost general acceptance in the relevant scientific community.

Excluding all of the fingerprint evidence precluded the jury from learning that the partial prints matched the defendant's known, rolled prints on at least several Galton points and did not exclude the defendant as having been at the scene. After Judge Souder reaffirmed her ruling, the State felt it could not go forward with the case, and the U.S. Attorney stepped in to consider pursuing a federal prosecution. *See* McMenamin, *U.S. Eyeing County Case*, THE BALT. SUN, 1B, col. 2, Feb. 21, 2008.

Since Judge Souder's opinion, at least two Maryland trial judges have declined to follow it: Judge Patrick Cavanaugh of Baltimore County Circuit Court, McMenamin, *Judge Rejects Request to Toss Out Fingerprints*, THE BALT. SUN, 4B, col. 2, Nov. 1, 2007, and Judge Dennis M. Sweeney of Howard County. *State v. Johnson* (No. 13-K-07-47108) (Howard Co. Cir. Ct., Mar. 26, 2008).

The State's witness in the Howard County case proffered that "he was able to form an opinion within a reasonable degree of certainty as to the identity of the person that left the latent print. . . ." *Id.* at 11. Judge Sweeney held that he would permit the expert to testify that he had found a close or exact "match" between the defendant's known print and the partial latent print, but not that "no other person in the world's print could also match

the latents,” as “currently validated science” does not go that far. *Id.* at 21-23. The court held that the defense was free to cross examine as to the “alleged flaws” in the ACE-V method, as well as to call its own expert. *Id.* at 23-24.

iii. *Federal: Admissible . . .*

The United States Court of Appeals for the Fourth Circuit was upheld, against a *Daubert* challenge, the admission of expert testimony regarding both **fingerprints and handwriting**. *United States v. Crisp*, 324 F.3d 261 (4th Cir. 2003). The majority of the panel found the reliability of the science of fingerprinting so well established that it need not be proved “every time opinion evidence is offered.” *Id.* at 268. *Accord United States v. Mitchell*, 365 F.3d 215 (3d Cir. 2004) (testimony of qualified expert regarding latent fingerprints was properly admitted, but court committed harmless error in taking judicial notice that “human friction ridges are unique and permanent throughout the area of the friction ridge skin, including small friction ridge areas, and that human friction ridge skin arrangements are unique and permanent,” as matter was subject to reasonable dispute); *United States v. George*, 363 F.3d 666, 672-73 (7th Cir. 2004) (FBI fingerprint examiner’s testimony regarding partial prints was properly admitted); *United States v. Sullivan*, 246 F.Supp.2d 700 (E.D. Ky. 2003) (ACE-V methodology for fingerprinting, as practiced by F.B.I., satisfied *Daubert*). *But see United States v. Llera Plaza*, 179 F.Supp.2d 492, 57 Fed. R. Evid. Serv. 983 (E.D. Pa. 2002) (withdrawn from F. Supp), *vacated & superseded*, 188 F.Supp.2d 599 (E.D. Pa. 2002) (initially excluding opinion that fingerprint came from a particular person).

The National Academy Report, however, may influence more courts to preclude absolutely positive “match” testimony, as did Judge Sweeney, and as have federal courts in other areas than fingerprints. *United States v. Davis*, 602 F.Supp.2d 658 (D. Md. 2009) (ruling admissible evidence regarding an initial match achieved by a “cold hit” from a DNA database when expressed as to rarity of the profile, rather than as random match probability, absent consensus as to the most reliable

statistical methodology to be applied); *United States v. Glynn*, 578 F.Supp.2d 567 (S.D.N.Y. 2008) (prosecutor's ballistics expert would be limited to opining only that a firearms match was "more likely than not"); *United States v. Green*, 405 F.Supp.2d 104 (D. Mass. 2005) (detective could testify about shell casings, but not that they matched gun in question "to the exclusion of every other firearm in the world"); *United States v. Hines*, 55 F.Supp.2d 62 (D. Mass. 1999) (concluding that expert can testify to similarities or dissimilarities between handwriting samples but not render identification).

d. Medical Opinions that Have Been Excluded Under *Daubert*

A number of the federal "bottom-line" results as to admissibility seem consistent with those reached in Maryland. *See, e.g., Attorney General of Oklahoma v. Tyson Foods, Inc.*, 565 F.3d 769, 780 (10th Cir. 2009) (no abuse of discretion in disregarding, on ground it was unreliable, testimony of state's experts who **opined that they identified poultry litter DNA in waters of Illinois River Watershed**; trial court properly applied *Daubert*'s factors, including lack of peer review, because "when experts employ established methods in their usual manner, a district court need not take issue under *Daubert*; however, where established methods are employed in new ways, a district court may require further indications of reliability"); *Henricksen v. Conocophillips Co.*, 605 F.Supp.2d 1142 (E.D. Wash. 2009) (excluding, as unreliable, experts' testimony regarding **causal link between tanker driver's exposure to gasoline and his acute myelogenous leukemia (AML)**); *Gross v. King David Bistro, Inc.*, 83 F.Supp.2d 597 (D. Md. 2000) (absent close temporal connection or scientific studies supporting expert's opinion that **infection with shigella sonnei caused fibromyalgia**, opinion was too unreliable to admit).

e. Polygraph: Out in Maryland, Sometimes In in Federal

i. Maryland: Inadmissible

Maryland excludes polygraph evidence as unreliable when offered to prove truthfulness or untruthfulness. *E.g., State v. Hawkins*, 326 Md. 270, 275, 604 A.2d 489 (1992); *Kelley v. State*, 288 Md. 298, 418 A.2d 217 (1980) (improper to allow witness to testify to opinion as to truth

and veracity, based on polygraph exam); *Oliver v. State*, 53 Md. App. 490, 496-97, 545 A.2d 856 (1983) (rejecting evidence offered by defendant that prosecution witness refused to submit to polygraph examination).

In 1998 the United States Supreme Court upheld Military Rule of Evidence 707, which, like Maryland case law, *per se* precludes the admission of polygraph evidence, as not violative of a court martial defendant's Fifth or Sixth Amendment rights to present a defense. *United States v. Scheffer*, 523 U.S. 303 (1998). Four concurring justices suggested, however, that a *per se* rule of exclusion is not "wise." *Id.* at 318 (Kennedy, J., joined by O'Connor, Ginsburg, and Breyer, JJ.). Justice Stevens dissented.

ii. *Federal: Court May Have Some Discretion*

E.g., *United States v. Apperson*, 441 F.3d 1162, 1196 (10th Cir. 2006) (no abuse of discretion in excluding evidence that confidential informant took two polygraph tests and failed one, on ground that **even if evidence satisfied *Daubert*, it was properly excluded for Fed. R. Evid. 403 reasons**); *United States v. Tokars*, 95 F.3d 1520, 1536 n.10 (11th Cir. 1996) ("**[p]olygraph evidence may be admitted to impeach or corroborate testimony of a witness at trial within the court's discretion**, so long as the opposing party has adequate notice of the evidence and an opportunity to secure its own polygraph.").

But the majority of a panel of the United States Court of Appeals for the Fourth Circuit has concluded that, due to post-*Daubert* decisions of that court, only an en banc decision could overrule the circuit's *per se* rule of inadmissibility of polygraph evidence. *United States v. Prince-Oyibo*, 320 F.3d 494, 497-501 (4th Cir. 2003). Judge Hamilton, dissenting, would have reversed and remanded the case to give the defendant the opportunity to show that his polygraph evidence was admissible under *Daubert*. *See also United States v. Webster*, 639 F.2d 174, 186 (4th Cir. 1981) (admission of polygraph evidence may be proper, especially if requested by defense rather than by prosecution, and if a nonjury trial), *opinion modified*, 669 F.2d 185 (4th Cir. 1982).

f. **Voiceprint : Maryland Out, Federal May Be In**

i. *Maryland*

Reed v. State, 283 Md. 374, 383, 391 A.2d 364, 371 (1978) (applying *Frye* and holding voiceprint inadmissible).

ii. *Federal*

See, e.g., United States v. Baller, 519 F.2d 463 (4th Cir. 1975) (no abuse of discretion in admitting) (citing conflicting federal decisions).

5. **Uniform Rules of Evidence: A Better Approach?**

Is there a better way? One possibility for a compromise modification of *Frye-Reed* is that adopted by the Uniform Law Commissioners. U.R.E. 702 (1999) uses *Frye* as the initial test, but a party dissatisfied with the result under *Frye* may challenge it by relying on the *Daubert* factors to prove that it is “more probable than not that the principle or method” is reasonably reliable (or not).

See Myrna Raeder, Proposed Revisions to the Uniform Rules of Evidence, AALS Evidence Section Newsletter, 2–3, Spring 1998 (“This proposal was believed to give judges the benefit of relying on the scientific community at the outset, while still giving the adverse litigant the opportunity to demonstrate the actual reliability or unreliability of the principle or methodology in question. Ultimately, **a rule codifying *Daubert* was viewed as requiring the judge to make a reliability determination in virtually every case, while this hybrid standard would both cut down the amount of challenges and also reestablish the judge’s ability to rely on the scientific community until challenged**, rather than requiring an independent evaluation of reliability from the outset.”).