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TOXIC TORTS**SCIENTIFIC EVIDENCE**

Pending before the District of Columbia's highest court in a case asking whether cell phones can cause cancer is whether to replace the jurisdiction's venerable *Frye* standard for reviewing the admissibility of scientific evidence with the approach adopted by the U.S. Supreme Court in *Daubert v. Merrell Dow*, Professor David H. Kaye says. The author analyzes one aspect of the two evidentiary standards that leads him to question the trial judge's suggestion in *Murray v. Motorola* that adopting the *Daubert* perspective would allow greater leeway in excluding the plaintiffs' evidence.

Cell Phones, Brain Cancer, and Scientific Outliers in *Murray v. Motorola*

BY DAVID H. KAYE

The District of Columbia Court of Appeals, the District's highest court, recently heard oral argument¹ on whether to discard the very test that its predecessor introduced into the law of evidence in the celebrated—and castigated—case of *Frye v. United States*.² That was 1923, and the evidence in question was a psychologist's opinion that a systolic blood pressure test showed that James Alphonso Frye was telling the truth when he recanted his confession to a notori-

ous murder in the District. With nary a citation to any previous case, the Court of Appeals famously wrote that

[W]hile 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

Now it is 2015, the case is *Murray v. Motorola, Inc.*,⁴ and the proffered evidence is expert testimony that cell phones cause (or raise the risk of) brain cancer. The methods used to form or support this opinion or related ones range from what the court calls “WOE” (the expert says, I thoroughly assessed the “weight of evidence”),⁵ to “PDM” (I considered the evidence of causation pragmatically, with the “Pragmatic Dialog Method”),⁶ to “a literature review” (I read everything I could),⁷ to “laboratory experiments” (I exposed cells to electromagnetic radiation),⁸ to “experience as a toxi-

³ *Id.* at 1014.

⁴ No. 2001 CA 008479 B (D.C. Super. Ct. Aug. 8, 2014) (Memorandum Opinion and Order on Expert Witness Admissibility) [hereinafter Memorandum Opin.].

⁵ *Id.* at 31, 55.

⁶ *Id.* at 40.

⁷ *Id.* at 48–49, 55.

⁸ *Id.* at 61, 66.

¹ Ann E. Marimow, *D.C. Court Considers How To Screen Out 'Bad Science' in Local Trials*, *Wash. Post*, Nov. 24, 2015.

² 293 F. 1013 (D.C. Cir. 1923).

biologist and pharmacologist”⁹ to show that “it is generally accepted to extrapolate findings from *in vitro* studies in human and mammalian cells to predict health effects in humans.”¹⁰

The trial judge, Frederick H. Weisberg, ruled much of this testimony admissible on the theory that regardless of the extent to which the conclusions are within the mainstream of scientific thinking, the “methods” behind them were generally accepted in ascertaining carcinogenicity. He chastised the defense for “repeatedly challeng[ing] plaintiffs’ experts on the ground that their conclusions and opinions are not generally accepted.”¹¹

As he construed *Frye*, “[e]ven if 99 out of 100 scientists come out on one side of the causation inference, and only one comes out on the other, as long as the one used a ‘generally accepted methodology,’ *Frye* allows the lone expert to testify for one party and one of the other ninety-nine to testify for the opposing party.”¹² Having placed himself in this box, Judge Weisberg also asked the Court of Appeals to let him out, writing that “most, if not all, of Plaintiffs’ experts would probably be excluded under the Rule 702/*Daubert* standard based on the present record”¹³ and granting the defendants’ request to allow them to appeal his ruling immediately. Defendants then convinced the Court of Appeals to grant interlocutory review of the evidentiary ruling en banc, with all nine judges participating.

The question before the en banc court is thus framed as whether to replace the jurisdiction’s venerable *Frye* standard with the approach sketched in *Daubert v. Merrell Dow Pharmaceuticals*.¹⁴ *Daubert* changes the focus from whether a theory or technique is generally accepted to whether it is scientifically valid. (See Box: The Supreme Court Ruling in *Daubert*).

But does *Frye* really require the trial court to admit evidence that *Daubert* might exclude in this case? The trial judge suggested that adopting a *Daubert* perspective would permit him to be more aggressive in excluding the plaintiffs’ evidence. But this is only because of the judge’s narrow construction of the scope of *Frye*. His reasoning is that *Frye* is sharply limited to “methodology”;¹⁵ it does not cover the “conclusion” that cell phones can cause brain cancers—even if this proposition is not accepted among knowledgeable scientists.¹⁶

⁹ *Id.* at 74.

¹⁰ *Id.* at 72–73.

¹¹ *Id.* at 20 n.22.

¹² *Id.* at 28.

¹³ No. 2001CA008479 B (D.C. Super Ct. Oct. 1, 2014) (Order Amending August 8, 2014, Memorandum Opinion and Order to Include Certification for Interlocutory Appeal), at 1.

¹⁴ 509 U.S. 579 (1993).

¹⁵ Memorandum Opin. at 22.

¹⁶ There is precedent for this view from other *Frye* jurisdictions. *E.g.*, *Ferebee v. Chevron Chem. Co.*, 736 F.2d 1529, 1535 (D.C. Cir. 1984); *Anderson v. Akzo Nobel Coatings, Inc.*, 260

However, exempting the ultimate opinion from the strict evidentiary scrutiny reserved for potentially dubious and dangerous scientific evidence is just as much a problem under *Daubert* as it is under *Frye*.

Daubert specifically states that the subject of the inquiry “is the scientific validity . . . 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.”¹⁷ Judge Weisberg decided that principles or putative methodologies like WOE, PDM, literature review, extrapolation from *in vitro* experiments, and experience are generally accepted among scientists as a basis for inferring carcinogenicity. If this is correct, and if it insulates the inference that cellphone transmissions can cause cancer from scrutiny for general acceptance under *Frye*, then it does the same under *Daubert* (as originally formulated).¹⁸ Surely, weighing all the relevant data, being pragmatic, studying the literature, considering experiments, and using experience is what scientists everywhere do. They do it not out of habit, but because these things tend to lead to more correct conclusions (and less criticism from colleagues) than the alternatives of not weighing all the data, being doctrinaire, and ignoring the literature.

The problem that *Murray* vividly highlights is that the line between “method” and “conclusion” is difficult to draw. In analyzing this issue, the trial court drew the line in the wrong place. It is hardly obvious that the process of reading the scientific literature and weighing

P.3d 857, 865 (Wash. 2011). But other opinions applying *Frye* in the toxic tort context look to general acceptance of causal theories (even if they seem to be “conclusions” of a sort). *See, e.g.*, *Betz v. Pneumo Abex, LLC*, 44 A.3d 27, 58 (Pa. 2012) (pathologist’s opinion that exposure to any amount of asbestos fibers can cause mesothelioma not generally accepted in view of epidemiologic studies to the contrary and the established view in toxicology that dosage matters); *Montgomery Mut. Ins. Co. v. Chesson*, 923 A.2d 939, 941 (Md. 2007) (“theories regarding the causal connection between mold exposure and certain human health effects [must be] generally accepted in the scientific community”); *Parker v. Mobil Oil Corp.*, 857 N.E.2d 1114, 1122 (N.Y. 2006) (experts’ conclusions that exposure to gasoline fumes caused acute myelogenous leukemia properly excluded where “Plaintiff’s experts were unable to identify a single epidemiologic study finding an increased risk of AML as a result of exposure to gasoline”). Even in *Anderson v. Akzo Nobel Coatings*, the court indicated that its concern was avoiding demands for scientific consensus on nearly case-specific propositions. 260 P.3d at 865 (rejecting defendant’s “evermore nuanced argument [that] to satisfy *Frye*, [plaintiff] must establish that the specific causal connection between the specific toxic organic solvents to which she was exposed and the specific polymicrogyria birth defect is generally accepted in the scientific community” because, with such excessive specificity, “virtually all opinions based upon scientific data could be argued to be within some part of the scientific twilight zone.”).

¹⁷ *Id.* at 594–95 (emphasis added); *see also Betz v. Pneumo Abex, LLC*, 44 A.3d 27, 58 (Pa. 2012) (unacceptable to “permit experts to evade a reasoned *Frye* inquiry merely by making references to accepted methods in the abstract”).

¹⁸ In *General Electric Co. v. Joiner*, 522 U.S. 136 (1997), the Supreme Court blurred the distinction between methodology and conclusion, and Congress later amended Rule 702 to incorporate this shift. The result is that in federal courts, it is less important to draw a better line than the one in *Murray* and *Ibn-Thomas*. *See* David H. Kaye, David A. Bernstein, and Jennifer L. Mnookin, *The New Wigmore: A Treatise on Evidence: Expert Evidence* § 9.2.2 (2d ed. 2011).

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The Supreme Court Ruling in *Daubert v. Merrell Dow*

In *Daubert*, the U.S. Supreme Court did not rule that *Frye* was antiquated or not up to job of screening out dangerous and dubious scientific evidence. Rather, the Court reasoned that in adopting the Federal Rules of Evidence in 1975, Congress implicitly rejected *Frye*'s "austere" requirement of general acceptance. The Court then read Federal Rule 702

as requiring scientific evidence to be, well, "scientific," as determined by district courts that could look to various hallmarks of scientifically warranted theories. But general acceptance, the Court observed, remained an important indicator of the scientific validity that courts had to find in order to admit suitably challenged scientific evidence.

A majority of U.S. jurisdictions (41 according to the trial court order in *Murray*), either by legislation or judicial decision, follow the *Daubert* approach for filtering out unvalidated or invalid scientific evidence (although they still place great weight on the presence of absence of general acceptance in the relevant scientific community).

that evidence represents what the *Frye* court called a "scientific principle or discovery." A literature review or even a more formal meta-analysis is a way to discern whether science has made a bona fide discovery. In contrast, in *Frye* the requirement applied to the alleged discovery itself—the specific theory that conscious deception causes a change in blood pressure that can be detected with a blood pressure cuff. Although Dr. Marston had published the results of experiments that supported this discovery, *Frye* surely could not have prevailed by arguing that Marston's method of detecting deception was just a conclusion from an inferential method that scientists generally accepted.

As this contrast indicates, the reasoning in *Murray* (and some cases on which it relies) threatens to drain the meaning out of the general acceptance standard. I have voiced this concern before. Although the opinion cites (the first edition of) *Wigmore on Evidence: Expert Evidence*,¹⁹ it ignores the warning that

Occasionally, however, courts define the theory or method at so high a level of abstraction that all kinds of generally applicable findings can be admitted without attending to whether the scientific community accepts them as well founded. For example, in *Ibn-Tamas v. United States*, [407 A.2d 626 (D.C. 1979)], the District of Columbia Court of Appeals reasoned that a psychologist's theory of the existence and development of various characteristics of battered women need not be generally accepted because an overarching, generally accepted methodology—clinical experience—was used to study the phenomenon. The problem, of course, is that such reasoning could be used to obviate heightened scrutiny for virtually any scientific development [citing, among other cases, *Commonwealth v. Cifizzari*, 492 N.E.2d 357, 364 (Mass. 1986) ("to admit bite mark evidence, including an expert opinion that no two people have the same bite mark, a foundation need not be laid that such identification technique has gained acceptance in the scientific community. What must be established is the reliability of the procedures involved, such as X-rays, models, and photographs.")]. Indeed, in developing the lie-detection procedure used in *Frye*, Marston applied generally accepted techniques of experimental psychology to test his theory and equipment. Thus, an exclusively "high-level" interpretation of *Frye* is untenable.²⁰

The opinion in *Murray* also overlooks the more extended analysis in *Wigmore* of why causation opinions in toxic tort cases should be considered "the thing" or "the scientific principle or discovery" rather than "the deduction" within the meaning of *Frye*.²¹ It would make no sense to ask whether psychologists generally accept the proposition that Dr. Marston correctly measured

the defendant's blood pressure or correctly applied some formula or threshold that indicated deception. Such case-specific facts do not appear before any general scientific community for scrutiny. On the other hand, an alleged association between elevated blood pressure and deception, a procedure for measuring blood pressure, and a formula or threshold for concluding that a subject is deceptive are trans-case propositions that behavioral scientists would be expected to address in normal scientific discourse.

The same is true of claims of carcinogenicity. Whether cell phones can cause brain cancer at various levels of exposure are trans-case propositions that stimulate scientific dialog. The *Frye* test can function just as well (or as poorly) in vetting expert opinions that exposure can cause cancer as in screening a psychologist's opinion that deception can cause a detectable and distinctive spike in blood pressure.²² In sum, denominating trans-case conclusions that have been or could be the subject of scientific investigation and controversy as "conclusions" that are beyond the reach of either *Frye* or *Daubert* is a category mistake.

Courts should not be misled by the fact that a generic conclusion such as "cellphones can cause brain cancer" can be written as the conclusion of an argument of the following form: (1) when scientific studies of a possible carcinogen, evaluated as a whole, have certain properties X, it is probably the case that exposure to that agent can cause cancer; (2) scientific studies of the electromagnetic radiation emitted by cellphones and absorbed by or passing through the cells of organisms (including humans) have the properties X; therefore (3) it is probably the case that cellphones can cause human cancer. The conclusion (3) is a generic, scientific claim that also is a premise in a longer inductive argument that ends with the specific conclusion that cellphones caused cancer in named plaintiffs. If plaintiffs had called a single

¹⁹ Memorandum Opin. at 19.

²⁰ *Id.* § 6.3.3(a)(1) (notes omitted). The same language appears in § 5.2.3 of the first edition.

²¹ *Id.* § 9.2.3(a)&(b).

²² The *Murray* court distinguished between "the deductive sciences: forensics, mathematics, applied physics, chemistry, and the like" and "inductive sciences such as epidemiology or psychology" for which "the [*Frye*] test is not a good gatekeeper." From a logical standpoint, only mathematics is deductive. All the others rely on inductive reasoning. *E.g.*, Brian Skyrms, *Choice and Chance: An Introduction to Inductive Logic* (4th ed. 1999).

medical doctor to testify to the latter conclusion, then proposition (3) no longer would be the conclusion in a chain of reasoning presented by the testifying expert. It would part of “the thing from which the deduction is made,” to use the language of *Frye*. It would need to be generally accepted before the final “deduction” could be admitted into evidence. That plaintiffs choose to partition the testimony into stages with distinct experts should not affect the reach of *Frye*.²³

We can put the point another way: Given the usual reasons to subject scientific evidence to stricter-than-normal scrutiny, courts in *Frye* jurisdictions need to consider whether it is generally accepted that the body of scientifically validated findings on which the expert relies to infer general causation is sufficient to justify, as scientifically reasonable, the trans-case conclusion. Thus, the Ninth Circuit Court of Appeals in *Daubert* originally reasoned—on the basis of *Frye*—that in the absence of some published, peer-reviewed epidemiological studies showing a statistically significant association, the causal theories (whether we call them conclusions or, instead, premises) of plaintiffs’ expert were inadmissible.

The Ninth Circuit determined that body of research, namely, “the available animal and chemical studies, together with plaintiffs’ expert reanalysis of epidemiological studies, provide insufficient foundation to allow admission of expert testimony to the effect that Bendectin caused plaintiffs’ injuries.”²⁴ It was appropriate—indeed, necessary—for experts to consider all the “available . . . studies,” but under *Frye*, there still had to be general acceptance of the proposition that drawing an inference of causation from studies of that num-

ber, caliber, and consistency was generally accepted as scientifically valid. Gussyng up the inferential process as a WOE analysis (or anything else) cannot alter this requirement. That many scientists, looking at the same body of research, have found it insufficient to support (3) is a reason, under *Frye* (as well as *Daubert*) to preclude scientific outlier testimony that cellphones can cause brain cancer.

In conclusion, whether or not the Court of Appeals switches to *Daubert*, it should correct the trial court’s blanket refusal to consider whether the theory that cellphones ever cause brain cancer at relevant exposure levels is generally accepted. On the one hand, if the Court of Appeals adheres to *Frye*, and if it agrees that the theory is *not* a case-specific conclusion immune from the normal need for strict scrutiny of scientific evidence, then the Superior Court needs to know this before presiding over a lengthy and complicated trial. On the other hand, if the Court of Appeals adopts *Daubert*, then general acceptance remains important, as an influential part of a *Daubert* analysis.²⁵ Wherever the inquiry into this factor is sited, *Daubert* or *Frye*, it should not be skewed by a misconception of the scope of that inquiry.²⁶

²⁵ *Daubert*, 509 U.S. at 594 (“Widespread acceptance can be an important factor in ruling particular evidence admissible, and a known technique which has been able to attract only minimal support within the community may properly be viewed with skepticism.”) (internal quotation marks and citation omitted).

²⁶ If the Court of Appeals adopts *Daubert*, it should consider providing guidance on whether the gloss placed on *Daubert* in *Joiner* and in the 2000 amendment to Federal Rule of Evidence 702 will apply in the District. See *supra* note 18; David E. Bernstein & Eric G. Lasker, *Defending Daubert: It’s Time to Amend Federal Rule of Evidence 702*, 57 *William & Mary L. Rev.* No. 1 (forthcoming 2015).

²³ *Kaye et al.*, *supra* note 18, § 9.2.3(a).

²⁴ *Daubert v. Merrell Dow Pharms., Inc.*, 951 F.2d 1128, 1131 (9th Cir. 1991).