
Comment

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Dueling Scientific Experts: Is Australia's Hot Tub Method a Viable Solution for the American Judiciary?

Adversarial expert testimony has been fraught with problems of partisanship since “just about the moment of its invention.”¹ Partisan expert witnesses in American courtrooms are anything but a recent phenomenon,² and court opinions and law review articles published over the past two centuries confirm both the presence and awareness of such bias.³ The basic origins of these problems were identified long ago and continue to be cited today, yet little or no progress has been made toward their elimination.⁴ When experts' testimony concerns scientific evidence, partisanship problems are further compounded by the complex theories underlying the

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¹ Jennifer L. Mnookin, *Expert Evidence, Partisanship, and Epistemic Competence*, 73 BROOK. L. REV. 1009, 1009 (2008).

² See *id.* at 1009–11; Posting of David H. Kaye, *Hot Tubbing: Old Wine in New Bottles for Expert Witnesses* to Science & Law Blog, http://lawprofessors.typepad.com/science_law/2008/08/old-news-on-exp.html (Aug. 11, 2008).

³ See Kaye, *supra* note 2.

⁴ Mnookin, *supra* note 1, at 1015; see also *Lord Abinger v. Ashton* 17 L.R.Eq. 358, 373–75 (Ch. 1873) (identifying bias among experts and problems of experts being paid for their testimony).

testimony, the societal views of the science, and the uncertainty intrinsic to every scientific discipline. The increased prevalence of science in the courtroom has elevated concern over these difficulties and has attracted the attention of judges, legislators, scholars, and practicing attorneys alike.⁵

Some critics of the current system argue that the best way to eliminate negative effects of adversarial expert testimony is to do away with adversarial experts altogether.⁶ This drastic approach has not been adopted for many reasons, including predictions that such modifications would fail to solve some of the significant problems attributed to this form of testimony.⁷ Therefore, more creative approaches to this conundrum must be considered, including the approaches employed by foreign judiciaries. Over the last decade, Australia has developed a method to reduce problems associated with adversarial expert testimony that may have applications within the American judicial system. The Australian innovation, formally known as concurrent expert testimony but more commonly known as the hot tub method or hot tubbing, involves a colloquium setting where multiple experts deliver their testimony and field questions from the judge, counselors, and each other in a single session.⁸ Advocates for this procedure claim it mitigates many adverse effects that arise from each side hiring and presenting their own experts.⁹ An examination of factors that complicate scientific testimony, common sources of bias, details of the hot tub's use in Australia, and key differences between the American and Australian judiciaries reveals that, while not always an ideal fit, the general principles of the hot tub procedure may find a home in American courtrooms.

Part I of this Comment examines the causes and challenges associated with conflicting scientific experts. Part II identifies and distinguishes common sources of bias that may further complicate the evaluation of dueling expert testimony. Possible solutions to these problems are explored in Part III, leading into an explanation of Australia's hot tub method and an evaluation of its strengths and

⁵ See, e.g., *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 149 (1997) (Breyer, J., concurring).

⁶ See, e.g., Hon. Garry Downes, *Problems with Expert Evidence: Are Single or Court-Appointed Experts the Answer?*, 15 J. JUD. ADMIN. 185 (2006).

⁷ See *id.*

⁸ E.g., Elizabeth Cheeseman, *Hot Tubbing: Concurrent Expert Evidence*, BARNEWS: J. NEW S. WALES B. ASS'N, Summer 2006/2007, at 54; Hon. Peter Heerey, *Recent Australian Developments*, 23 CIV. JUST. Q. 386, 390–91 (2004).

⁹ See, e.g., Heerey, *supra* note 8, at 391.

weaknesses in Part IV. Part V discusses factors to consider in determining whether or not particular testimony lends itself to the hot tub procedure, while Part VI focuses specifically on ways the procedure could further ease the evaluation of dueling scientific expert testimony. Part VII identifies both the similarities and differences between the American and Australian court systems, as well as the differences that materially affect the applicability of the hot tub in the United States. Part VIII addresses some of these difficulties and suggests modifications to adapt the hot tub method to the American courts.

I

COMPLICATIONS OF SCIENTIFIC EXPERT TESTIMONY

Of all the fields of expertise from which witnesses may be called, scientific expert testimony deserves special consideration.¹⁰ In recent years, “[s]cientific and technical evidence has increased dramatically . . . both in its frequency and its complexity.”¹¹ Different areas of science, including geology, chemistry, physics, and biology, commonly play a role in today’s courts. Criminal trials relying on forensic evidence, claims brought under the Endangered Species Act, toxic tort litigation, hazardous waste cleanup disputes, and other proceedings almost always involve expert testimony from at least one scientific discipline.

In addition to its increasing prevalence in the courtroom, scientific testimony is special because it often concerns complex theories and matters unfamiliar to the finder of fact. All experts called to testify are better acquainted with the subject matter of their testimony than the average person, and the theories underlying scientific testimony are frequently abstract, difficult to ground in common knowledge, and not easily relatable to everyday experiences. Judges, and certainly juries selected at random from the general population, cannot be

¹⁰ As this section illuminates, certain characteristics of scientific expert testimony, including the public’s perception of “scientific evidence,” distinguish it from other types of evidence and testimony. Because of this, judges and rule-makers should pay special attention to such evidence when presented in their courtrooms or when drafting pertinent rules. In particular, it is important that judges and rule-makers consider how juries are likely to perceive such evidence, the weight they assign to it, and how this might influence their fact-finding abilities.

¹¹ Hon. Geoffrey L. Davies, *The Changing Face of Litigation*, 6 J. JUD. ADMIN. 179, 188 (1997); see also *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 149 (1997) (Breyer, J., concurring) (specifically noting that “science-related issues have increased in number”).

expected to have specialized knowledge or schooling in a scientific area in order to be fit to hear the case. Yet judges and juries alike are called upon to evaluate expert testimony and often to determine which of two competing views is “correct.” As one Australian judge summarized:

[T]he difficulty of a trier of fact, whether judge or jury, in understanding and consequently in assessing the reliability of such evidence, though not a new problem, has now become a critical one. . . . [T]here is now a good deal of [scientific and technical] evidence that is quite beyond the capacity of most judges to understand. And in many cases in which a judge has some capacity to understand the evidence he or she will lack the capacity to decide between competing opinions. Nevertheless, here and elsewhere, judges continue to decide such questions¹² on the apparent assumption that they have the capacity to do so.

In American civil and criminal trials, the fact-finding role is often filled by jurors rather than judges, further complicating considerations of how to best aid the finder of fact in the evaluation of competing scientific evidence.

Additionally, scientific evidence requires special consideration due to the high degree of reliability often accredited to scientific data and results. People frequently and mistakenly assume that scientific findings are objective determinations of “truth” and that scientists, armed with the rigorous and objective scientific method, report only true, objective “facts.” However, classifying scientific findings as the manifestation of purely objective methods is an idealization of a field that is heavily influenced by funding sources, political climate, cultural norms, and the subjective interpretations of laboratory scientists.¹³ In other words, “[t]he ‘facts’ that scientists discover about physical and social phenomena . . . are not pure, unmediated renditions of an external reality whose objectivity is secured by a single, transcendent scientific method.”¹⁴ Despite the effects of these outside influences, scientific findings still enjoy the overall perception of objective “truth” in our society.¹⁵ These common misconceptions surrounding scientific results risk clouding the minds of fact finders in the courtroom, as “jurors tend to ascribe an inordinately high degree

¹² Davies, *supra* note 11, at 188.

¹³ See, e.g., David S. Caudill, *Ethnography and the Idealized Accounts of Science in Law*, 39 SAN DIEGO L. REV. 269, 272–73, 277 (2002).

¹⁴ Sheila Jasanoff, *Law’s Knowledge: Science for Justice in Legal Settings*, 95 AM. J. PUB. HEALTH S49, S54 (Supp. 2005).

¹⁵ See, e.g., *id.* at S49.

of certainty to proof derived from an apparently ‘scientific’ mechanism, instrument, or procedure.”¹⁶

Fact finders may also fail to recognize that, because scientific conclusions are not completely objective, more than one supportable conclusion may be drawn from a single scenario. When two experts testify to two different conclusions based on the same evidence, the finder of fact may jump to the conclusion that only one finding is correct, and the other must be “junk science,” while forgetting the possibility that both may coexist or the possibility that neither can be proven true with absolute certainty.¹⁷ It is important for the finder of fact to understand why scientific testimonies might vary when determining which experts’ interpretation is most appropriate for evaluating a given case. Likewise, identifying common reasons why scientific conclusions may vary is essential to evaluating possible techniques to mitigate the problems of dueling experts.

There are several reasons why two scientific experts might reach and testify to two different conclusions from the same scenario. First, and arguably most concerning to the judicial system, is the possibility that one expert’s testimony relies on “junk science”—science that is either not accepted in the community, based on ill-founded principles, idiosyncratic, or otherwise defiant of conventional scientific wisdom.¹⁸ The U.S. Supreme Court first addressed the admissibility

¹⁶ *People v. McDonald*, 690 P.2d 709, 724 (Cal. 1984); see also David E. Bernstein, *Expert Witnesses, Adversarial Bias, and the (Partial) Failure of the Daubert Revolution*, 93 IOWA L. REV. 451, 455 (2008) (“[J]urors may be particularly likely to assume that an expert witness, particularly a scientist, is an unbiased participant in the proceedings.”).

Even if the scientific method existed and functioned in an ideal, unadulterated form, it would still lack the ability to prove conclusions with absolute certainty. At its most fundamental level, science is based on formulating, rejecting, and modifying hypotheses in accordance with empirical evidence gathered through observation and experimentation. While increased support may eventually elevate the status of a hypothesis to that of a well-tested, universally accepted theory, a hypothesis can never be proven with absolute certainty. Instead, theories and hypotheses are always subject to falsification by further empirical evidence. Thus, even in cases where neither party disputes scientific conclusions drawn from the relevant facts and evidence, it is important to remember that science lacks the ability to provide a definite assurance of truth.

¹⁷ See, e.g., David S. Caudill, *Advocacy, Witnesses, and the Limits of Scientific Knowledge: Is There an Ethical Duty to Evaluate Your Expert’s Testimony?*, 39 IDAHO L. REV. 341, 353 (2003); Jasanoff, *supra* note 14, at S54 (“[T]he existence of controversy does not mean in and of itself that one or the other side has adopted an ‘unscientific’ method or is propagating ‘junk science’; it could simply mean that uncertainties are unresolvable in the present state of knowledge.”).

¹⁸ Thomas G. Gutheil & Harold J. Bursztajn, *Attorney Abuses of Daubert Hearings: Junk Science, Junk Law, or Just Plain Obstruction?*, 33 J. AM. ACAD. PSYCHIATRY & L. 150, 150 (2005).

of scientific evidence in federal court in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, which positioned the judge as an evidentiary gatekeeper charged with the task of keeping junk science out of the courtroom.¹⁹ Under *Daubert*, either party may make a pretrial motion challenging a party's scientific or expert testimony.²⁰ Such a challenge results in a formal evaluation and judicial determination of the admissibility of the expert testimony based upon the evidence's reliability.²¹ By applying various factors set out by the *Daubert* Court, the judge assesses the merits of the evidence with the aim of excluding junk science from the courtroom.²²

While the possibility of junk science squeezing into the post-*Daubert* courtroom may still be cause for concern, dueling scientific testimony arising from more nuanced conflicts often presents a greater challenge for the finder of fact. In these circumstances, it is more difficult to ferret out, through standard witness direct and cross-examination, precisely where the two conflicting opinions differ and the cause of that difference. Further determining which testimony is closer to the "truth," or most appropriate for a given set of facts, is even more challenging.

Two experts, neither of whom relies on junk science, might disagree because they adhere to two different schools of thought, both of which are supportable. Two psychiatrists, for instance, would likely draw different conclusions upon examining the same patient if one relied on Freudian and the other on non-Freudian psychiatry.²³ Though they may be at odds with each other, both opinions could draw sufficient support from their respective schools of thought. Experts might also disagree due to unresolved controversies within their discipline. Whether social isolation is a risk factor for heart disease, for instance, represents a controversy that has not been fully

¹⁹ 509 U.S. 579, 597 (1993). Two subsequent U.S. Supreme Court cases join *Daubert* to form the "Daubert Trilogy." In *General Electric Co. v. Joiner*, the Court established abuse of discretion as the standard of review for appellate courts reviewing trial courts' determinations of admissibility of expert testimony. 522 U.S. 136, 139 (1997). In *Kumho Tire Co. v. Carmichael*, the Court held that trial court judges serve as the gatekeepers for all expert testimony, including nonscientific expert testimony. 526 U.S. 137, 141 (1999).

²⁰ See *Daubert*, 509 U.S. at 592.

²¹ *Id.* at 592-93.

²² The *Daubert* factors include: whether the technique or theory can be, and has been, tested; whether the technique or theory has been subjected to peer review and publication; whether the technique or theory has been generally accepted; and the technique's or theory's known or potential rate of error. *Id.* at 593-94.

²³ Downes, *supra* note 6, at 187.

resolved within the medical profession and could lead to a difference in expert opinions in a medical dispute.²⁴ These types of controversies frequently involve issues of new hypotheses that have some support but have not been fully investigated, perhaps because a conclusive way to test various postulates has yet to be developed.

Scientific conclusions may also differ based on assumptions made throughout the process of analyzing the same scenario. For example, two experts may hold different opinions regarding the most appropriate way to take a measurement, make an observation, or apply a body of knowledge to certain criteria.²⁵ Field biologists, for instance, who employ different methods of counting individual animals of a certain species, may collect disparate data for use in population calculations, leading to two distinct, but supportable, conclusions. Similarly, experts frequently disagree on what constitutes “good data” that ought to be included in their calculations rather than excluded due to methodological flaws.²⁶ Each expert could give legitimate reasons why the assumptions that led them to their choice of counting methods or data selection are valid and preferable. Each expert may even acknowledge the validity in the other expert’s methodology. In these situations, the court is left with two supportable views, neither of which is “junk.” When considering possible ways to address issues of dueling scientific experts, it is important to acknowledge both why two experts might disagree and that both testimonies may be founded on legitimate and supportable reasoning.

II

BIAS IN EXPERT TESTIMONY

In addition to difficulties arising from plausible, but conflicting, opinions and the complex nature of scientific testimony, evaluating adversarial expert testimony is further complicated by expert bias. Understanding the origins of bias associated with partisan expert testimony is important when considering possible solutions to this longstanding problem. The most blatant forms of adversarial expert bias stem from the reality that experts are paid for their testimony.²⁷ Because of the business relationship between an expert and one party

²⁴ *Id.*

²⁵ *Id.*

²⁶ Mnookin, *supra* note 1, at 1024.

²⁷ *Id.* at 1010.

to a case, experts are overwhelmingly viewed as “hired guns” who “adapt their opinions to the needs of the attorney who hires them.”²⁸ Michigan Law Professor Samuel Gross spoke straight to the heart of this problem by stating “[e]xperts in other fields see lawyers as unprincipled manipulators of their disciplines, and lawyers and experts alike see expert witnesses—those members of other learned professions who will consort with lawyers—as whores.”²⁹ While this characterization is likely inappropriately harsh for the majority of expert witnesses, other, more subtle forms of bias generated by parties hiring their own experts may affect the objectivity of expert testimony.³⁰

Bias arising from the exchange of testimony for cash can be broken down into several categories, which may or may not contribute to a particular expert’s ability to offer objective testimony. First, and most troubling, certain “unscrupulous experts will literally offer themselves for hire, selling their opinions and their credentials to anyone who meets their price.”³¹ Once hired, these professionals use their credentials to back their testimony, whether or not it is based on sound analysis or credible theories. This behavior echoes Gross’s depiction of experts as prostitutes, willing to testify to anything for the right price.

Even where this is not the case and experts genuinely resist behavior that might land them in this class of “whores,” unconscious bias may still affect an expert’s objectivity. Working closely with only one party makes witnesses susceptible to developing a natural bias for that side of the case, which can threaten their ability to testify objectively.³² While more subtle and less amoral than testifying to just about anything given the right price, this type of bias still causes experts to slant their testimony in favor of the party who signs their paycheck.³³

Although it may seem logical that experts ought to be chosen by their reputation and experience in their field of specialty, in reality

²⁸ Bernstein, *supra* note 16, at 454–55.

²⁹ Samuel R. Gross, *Expert Evidence*, 1991 WIS. L. REV. 1113, 1115 (1991).

³⁰ While this critique is especially blunt, it conforms to the general consensus that hired experts often do not present objective views from their fields of expertise, instead matching their opinions to the needs of those who pay them. *E.g.*, Bernstein, *supra* note 16, at 454–55; Mnookin, *supra* note 1, at 1010–11; *see also* Gross, *supra* note 29, at 1115.

³¹ Mnookin, *supra* note 1, at 1011.

³² *Id.* at 1010–11.

³³ *Id.* at 1011.

expertise is secondary to whether the expert's views match the needs of the hiring attorney. Attorneys tend to shop for experts based on the specific opinions they will, or can, be paid to offer in court.³⁴ Some attorneys may encounter ten, twenty, fifty, or more experts who hold views disparate to the opinion desired before finding one whose opinion aligns with their needs and is willing to testify. This does not render a "'fair professional opinion' from each party's experts, but 'an exceptional opinion' from each side."³⁵ Known as selection bias, this particular type of bias means "experts retained by a party will not represent a random sampling of expert opinions."³⁶ Instead, it is likely that at least one, if not both sides, will present expert opinions that lie toward the far extremes of the spectrum of views held throughout the field. Thus, even though the court will benefit from hearing multiple points of view, it might only hear viewpoints on the fringes of the discipline and not the predominate view of the field. The prevalence of selection bias indicates that attorneys "often have a sufficient number of available expert witnesses to allow them to select one that will best represent a client's partisan interests."³⁷ Furthermore, selection and conscious bias eliminate the traditional relationship between price and quality, as price is not based on the prestige of an expert's scholastic or professional credentials, but rather the specific opinions experts are willing to furnish.³⁸

Significant weight is also placed on an expert's comfort and ability to adapt to the courtroom setting. Scientists who do not testify in court regularly, for instance, are generally unaccustomed to presenting their findings in such an adversarial setting. An expert with less impressive credentials who is at ease on the stand tends to be favored over a highly respected expert whose uneasiness or unfamiliarity with the judicial process compromises the expert's ability to deliver convincing testimony.³⁹ Attorneys are thus further

³⁴ See, e.g., Gross, *supra* note 29, at 1129–33.

³⁵ Bernstein, *supra* note 16, at 456 (quoting *Lord Abinger v. Ashton*, 17 L.R.Eq. 358, 374 (Ch. 1873)).

³⁶ *Id.*

³⁷ *Id.* at 455 n.16 (quoting BRUCE D. SALES & DANIEL W. SHUMAN, *EXPERTS IN COURT: RECONCILING LAW, SCIENCE, AND PROFESSIONAL KNOWLEDGE* 6 (2005)); see also Gross, *supra* note 29, at 1129–30.

³⁸ See Mnookin, *supra* note 1, at 1011–12.

³⁹ See, e.g., Gross, *supra* note 29, at 1133 ("Attorneys . . . shop around for those experts with the best testimonial manner and the most appealing credentials, and they avoid those experts (however knowledgeable) who look bad, speak poorly, or have insufficiently impressive diplomas.").

incentivized to hire experts based not on their qualifications as a scientist or reputation in their field of expertise, but rather on their comfort on the stand and ability to adapt to courtroom procedures.

The market for expert testimony has allowed some experts to transition the bulk of their work from within their field of specialty to the witness stand.⁴⁰ Experts who make this transformation to professional witnesses have an incentive to maintain a favorable reputation among potential employers within the legal community. This “strong interest in maintaining . . . marketability by being a ‘team player’” has led to a “marketplace for experts [that cannot] be trusted to produce reliable information.”⁴¹ Basically, in addition to slanting an opinion for the benefit of one employer and the particular case at hand, professional witnesses have an interest in providing testimony that will help them build a profitable reputation. Selection bias, conscious and unconscious bias, and professional self-interest pose significant threats to obtaining justice in cases requiring expert testimony. While an expert’s duty officially lies with the court, the adversarial setting compromises the likelihood of experts testifying objectively.⁴²

Despite all the problems that accompany partisan expert testimony, American courts continue to rely on this system, leaving the task of sorting through the opposing testimony to judges and juries as they strive to arrive at a just conclusion. The obvious difficulty is that most judges, and certainly most jurors, do not have the expertise to evaluate expert testimony on its merits and must rely on secondary factors. Irish Justice Philip O’Sullivan described the frustration of evaluating two coherent, but contradicting, expert testimonies as a situation with “no easy or obvious solution” that left him “feeling like an intellectual pygmy looking up at two giants [unable,] from that vantage point[, to] tell which of them [was] taller.”⁴³ In these situations, where the fact finder lacks the requisite knowledge to evaluate expert testimony based on its actual content, judges and juries are left to evaluate competing testimony based on secondary indicia of expertise.⁴⁴ Thus, factors like an expert’s charisma, confidence, curriculum vitae, and ability to explain material without

⁴⁰ See, e.g., *id.* at 1131; Mnookin, *supra* note 1, at 1011–12.

⁴¹ Mnookin, *supra* note 1, at 1012.

⁴² Bernstein, *supra* note 16, at 454 n.13.

⁴³ Hon. Philip O’Sullivan, *A Hot Tub for Expert Witnesses*, 4 JUD. STUD. INST. J. 1, 2 (2004).

⁴⁴ Mnookin, *supra* note 1, at 1012–13.

sounding condescending become much more important. While these proxies are often inadequate or difficult to evaluate, the fact finder frequently has no choice but to rely on them when differentiating between opposing testimony.⁴⁵

The United States is not the only nation that relies upon adversarial expert testimony. Consequently, the problems arising from this method are not unique to the American court system.⁴⁶ For example, Lord Woolf of England echoed concerns over hired experts, reporting:

Expert witnesses used to be genuinely independent experts. Men of outstanding eminence in their field. Today they are in practice hired guns. There is a new breed of litigation hangers-on, whose main expertise is to craft reports which will conceal anything that might be to the disadvantage of their clients.⁴⁷

Likewise, Australian attorneys frequently call their own hired experts to the stand, and the Australian court system continues to fight the ongoing battle of biased experts.⁴⁸ Because the difficulties posed by adversarial expert testimony in America are substantially similar to those found in foreign courts employing similar systems, foreign tactics to squelch these problems are of significant interest. While procedural and evidentiary rules vary between nations, it is worth considering innovative solutions proposed by foreign jurisdictions, as some may be adapted to suit American courts.

⁴⁵ *Id.* at 1014.

⁴⁶ America's approach to expert witnesses, however, is not followed by the majority of foreign judiciaries where "expert witnesses are selected by judges and are meant to be neutral and independent." Adam Liptak, *Experts Hired to Shed Light Can Leave U.S. Courts in Dark*, N.Y. TIMES, Aug. 12, 2008, at A1; see also John H. Langbein, *The German Advantage in Civil Procedure*, 52 U. CHI. L. REV. 823, 835 (1985) ("The European jurist who visits the United States and becomes acquainted with our civil procedure typically expresses amazement at our witness practice. His amazement turns to something bordering on disbelief when he discovers that we extend the sphere of partisan control to the selection and preparation of experts. In the Continental tradition experts are selected and commissioned by the court, although with great attention to safeguarding party interests.").

⁴⁷ Downes, *supra* note 6, at 185 (quoting LORD WOOLF, ACCESS TO JUSTICE, INTERIM REPORT TO THE LORD CHANCELLOR ON THE CIVIL JUSTICE SYSTEM IN ENGLAND AND WALES 183 (1995)).

⁴⁸ See, e.g., Cheeseman, *supra* note 8, at 54.

III POSSIBLE SOLUTIONS

Concerns over partisan expert testimony have prompted the formulation of many alternatives to adversarial expert testimony, each with its own proclaimed advantages.⁴⁹ None, however, have successfully replaced the adversarial expert system in American courts.

The court-appointed expert is perhaps the most frequently suggested solution as it eliminates dueling experts altogether by limiting expert testimony to a single opinion. The appointment of the single expert may involve the parties' approval, or the court may appoint the expert without the consent of the parties to the suit.⁵⁰ While the court-appointed expert prevents disagreement between experts on the stand, it gives rise to a new set of concerns involving the adequacy of expert testimony.⁵¹

Beyond the inconvenience of deviating from a long-implemented procedure, disadvantages of other potential methods of eliminating multiple expert opinions are prohibitive to change.⁵² Reducing the number of experts from those provided by each side of a suit to a single advising expert is particularly worrisome where scientific testimony is concerned.⁵³ As discussed above, there are various reasons why scientific experts might draw differing conclusions.⁵⁴ Different, legitimate conclusions are intrinsic to scientific research and development and drawing from only one source, regardless of how well respected, limits evidence to one of possibly many supportable scientific viewpoints. Australian Justice Gary Downes summarized this shortcoming of single expert testimony by stating: "The fallacy underlying the one-expert argument lies in the unstated [premise] that in fields of expert knowledge there is only one

⁴⁹ See, e.g., Downes, *supra* note 6, at 185.

⁵⁰ E.g., *id.*

⁵¹ See, e.g., *id.*

⁵² Joseph Sanders, *Expert Witness Ethics*, 76 *FORDHAM L. REV.* 1539, 1583 (2007) (explaining that, while there may be benefits to moving away from party control over expert testimony, the tradition of adversarial expert testimony will likely be difficult to overturn). "One cannot ignore . . . the entrenched nature of current arrangements. Whatever the merits of substantial reforms such as the greater use of court-appointed experts, they seem unlikely to occur in the short run." *Id.*

⁵³ See Downes, *supra* note 6, at 186–87.

⁵⁴ See *supra* text accompanying notes 17–26.

answer.”⁵⁵ While single expert testimony will increase efficiency and make the job of the finder of fact easier, it provides “no way [to test] whether the [expert’s] conclusions are correct[, as] there is nothing to test the expert evidence against.”⁵⁶ There is no method to counter the testimony presented with another possible conclusion that might either shine light on the subjectivity underlying the testimony or explain new developments that may be well grounded in scientific reasoning—but not yet accepted widely or by the testifying expert.

Adversarial expert testimony, on the other hand, introduces multiple viewpoints and avoids the problems of hearing only one, of possibly many, respected perspectives. Though far from perfect, adversarial expert testimony has significant advantages over single-expert methods, particularly in fields where well-respected experts frequently draw different conclusions.

IV

AUSTRALIA’S HOT TUB METHOD

One possible solution that preserves the benefits of hearing multiple scientific viewpoints, while also combating the alarming problems of “hired guns” and other challenges typically associated with adversarial experts and complex scientific evidence, has been developed in Australian courts over the last decade.⁵⁷ Hot tubbing, more formally known as concurrent evidence, involves experts from each side engaging, under oath, in a conversation with each other, the judge, and counsel from both sides of the case.⁵⁸ This relatively informal technique is praised for reducing, and even eliminating, some of the problems of traditional methods of adversarial expert testimony, while continuing to allow each side to select and present their own witnesses. While the images invoked by its namesake are undoubtedly more entertaining than the actual procedure, this new way of conducting “dull legal events” has proven effective at

⁵⁵ Downes, *supra* note 6, at 186.

⁵⁶ *Id.* at 187.

⁵⁷ When considering this procedural innovation, it is important to note that Australian federal courts do not utilize juries or hear criminal trials. *See infra* text accompanying notes 127–28. The implications of these differences and possible methods to adapt for such differences are detailed later in this Comment. *See infra* Parts VII–VIII.

⁵⁸ *See infra* text accompanying notes 60–68.

resolving some of the problems that typically accompany expert evidence.⁵⁹

While there are many slight variations in methodology, former Australian Justice Peter Heerey's description of the hot tub outlines the basics of the procedure:

The procedure involves the parties' experts giving evidence in the presence of each other after all the lay evidence on both sides has been given. The experts are sworn in and sit in the witness box or a suitably large table which is treated notionally as the witness box. . . . A day or so previously, each expert will have filed a brief summary of his or her position in the light of all the evidence so far. In the box the plaintiff's expert will give a brief oral exposition, typically for ten minutes or so. Then the defendant's expert will ask the plaintiff's expert questions, that is to say directly, without the intervention of counsel. Then the process is reversed. In effect a brief colloquium takes place. Finally each expert gives a brief summary. When all this is completed,⁶⁰ counsel cross-examine and re-examine in the conventional way.

Thus, experts and counsel are able to discuss conflicting expert testimony, hear from each side contemporaneously, and have the opportunity to defend, clarify, and distinguish their own evidence in the course of questioning their colleagues. Generally, the presiding judge may also ask questions at any time throughout the procedure.⁶¹ In other variations, each expert's "brief oral exposition [may be] omitted,"⁶² the number of experts participating in the hot tub procedure may vary, or the experts may even meet or exchange written reports before trial concerning their views on the pertinent issues.⁶³

⁵⁹ Though its name may suggest otherwise, hot tubbing does not involve bathing suits and warm water baths in the courtroom. Experts do not climb into bubbling hot tubs perhaps, as former Australian Justice Peter Heerey suggests, because "[c]onstraints of propriety and court design dictate a less exciting solution." Heerey, *supra* note 8, at 390. The "irreverent soubriquet," *id.*, of "hot tub" may have been chosen over more descriptive, albeit less provocative, labels such as concurrent expert evidence as a way to "stimulate interest at otherwise dull legal events." Paul Stockton, *Comment: Some Lessons from Australia*, ADJUST NEWSL. (Council on Tribunals, London, U.K.), July 2006, ¶ 12, available at http://www.council-on-tribunals.gov.uk/adjust/item/comment_australia.htm.

⁶⁰ Heerey, *supra* note 8, at 390–91.

⁶¹ RITA FARRELL, 'HOT TUBBING' ANTHROPOLOGICAL EVIDENCE IN NATIVE TITLE MEDIATIONS 4 (Nat'l Native Title Tribunal 2007), available at <http://nntt.gov.au/Publications-And-Research/Tribunal-Research/Documents/Hot%20tubbing.pdf>.

⁶² Heerey, *supra* note 8, at 391.

⁶³ See, e.g., Cheeseman, *supra* note 8, at 56–57; FARRELL, *supra* note 61, at 4. Exchange of expert reports may be very helpful in jurisdictions that require identification of experts before trial. Rule 26(a)(2) of the Federal Rules of Civil Procedure requires that

The Australian judiciary developed hot tubbing as part of an effort to overcome the difficulties associated with adversarial expert testimony.⁶⁴ The procedure appears to have its roots in the Trade Practices Tribunal of Australia, where it was suggested by counsel and adopted by Justice Lockhart,⁶⁵ a “much revered” judge in the Australian Federal Court.⁶⁶ Hot tubs were formally incorporated into some Australian courts by an amendment to the Federal Court Rules in 1998, and other Australian courts introduced similar procedures as well.⁶⁷ Hot tubs are now used in a variety of cases in several courts and tribunals of Australia as well as in Canadian administrative competition proceedings and some international administrative procedures.⁶⁸

A. Benefits of Hot Tubbing

Several key benefits are ascribed to hot tubbing. First, the hot tub is a tool used to focus expert testimony to the actual issue in

parties disclose the identity of expert witnesses they may use in trial. Unlike in federal court, however, there is no requirement in Oregon courts for parties to disclose the identity of their experts until they take the stand. *See, e.g.,* Symposium, *Panel Two*, 24 EMORY BANKR. DEV. J. 289, 291–92 (2008) (“[I]n Oregon the only time you learn about expert testimony is when the judge looks down at the other side and says, ‘Call your next expert—next witness.’ . . . It’s trial by ambush there. But nearly everywhere else you’re going to have a chance to get into the details of the expert’s testimony, and the other side, of course, will get a chance to get into the details of your expert, which is a good thing. I’m against trial-by-ambush as much fun as it is.”). Thus, hot tub activities requiring the identities of experts to be revealed before they are called to the stand could not be compelled in jurisdictions such as Oregon. Parties may, however, voluntarily reveal their experts if they are convinced of the benefits of such pretrial hot tubbing activities.

The term “hot tubbing” is sometimes used to describe a pretrial or out-of-court conference of experts rather than the concurrent collection of evidence in court described above. FARRELL, *supra* note 61, at 5. The in-court concurrent method, however, is the meaning most commonly associated with the term “hot tub” and will be the designated meaning of “hot tubbing” for the purposes of this Comment.

⁶⁴ Hon. Garry Downes, President, Admin. Appeals Tribunal, *Concurrent Expert Evidence in the Administrative Appeals Tribunal: The New South Wales Experience 3* (Feb. 27, 2004) (unpublished paper presented at the Australasian Conference of Planning and Environment Courts and Tribunals in Hobart), *available at* <http://www.aat.gov.au/SpeechesPapersAndResearch/speeches/downes/pdf/concurrent.pdf>.

⁶⁵ Heerey, *supra* note 8, at 390.

⁶⁶ Geoffrey L. Davies, *Recent Australian Developments: A Response to Peter Heerey*, 23 CIV. JUST. Q. 396, 397 (2004). Justice Lockhart adopted the procedure in 1976. *Id.*

⁶⁷ ADMIN. APPEALS TRIBUNAL (Austl.), AN EVALUATION OF THE USE OF CONCURRENT EVIDENCE IN THE ADMINISTRATIVE APPEALS TRIBUNAL 7–9 (2005), *available at* <http://www.aat.gov.au/SpeechesPapersAndResearch/Research/AATConcurrentEvidenceReportNovember2005.pdf>; Downes, *supra* note 64, at 3.

⁶⁸ Lisa C. Wood, *Experts in the Tub*, ANTITRUST, Summer 2007, at 95, 95.

dispute.⁶⁹ As stated by former Justice Heerey, the hot tub method allows experts to testify “when the critical issues have been refined and the area of real dispute narrowed to the bare minimum.”⁷⁰ Under traditional methods, identifying the points opposing experts actually agree and disagree to may be confusing. By narrowing expert testimony and stripping away peripheral areas of agreement, the actual issue in dispute is less likely to be clouded by superfluous technical or scientific testimony.

Second, the hot tub method allows experts testifying on the same subject to do so contemporaneously. This can aid the finder of fact significantly, especially in trials where experts’ testimony might otherwise be separated by a period of days or even weeks.⁷¹ Hearing the testimony of opposing experts contemporaneously allows the finder of fact to avoid having “to compare a witness giving evidence now with the half-remembered evidence of another expert given perhaps some weeks previously.”⁷² Contemporaneous testimony also confines modifications or qualifications of testimony that may otherwise occur after an expert takes the stand to a single, discrete time period. This helps the fact finder apprehend the contents and implications of a particular expert’s testimony, including the assumptions behind the evidence that “may [be] destroyed or substantially qualified” before the next expert takes the stand.⁷³

Even in cases where experts are able to testify consecutively without a period of days separating their appearances, having multiple experts testify at once avoids the problem of having to later recall each expert to the stand to clarify their opinion or rebut an opposing expert. Thus, covering all expert testimony at one time both prevents time lapses from clouding fact finders’ memories and avoids the hassle of recalling experts every time they would like to refute or qualify statements made by opposing experts.⁷⁴

⁶⁹ See, e.g., Cheeseman, *supra* note 8, at 55; Heerey, *supra* note 8, at 391; Stockton, *supra* note 59, ¶ 14; Wood, *supra* note 68, at 96.

⁷⁰ Heerey, *supra* note 8, at 391.

⁷¹ ADMIN. APPEALS TRIBUNAL, *supra* note 67, at 9.

⁷² Heerey, *supra* note 8, at 391.

⁷³ See *id.*

⁷⁴ See, e.g., Downes, *supra* note 64, at 4 (“[I]n contrast to the conventional approach, where an interval of up to several weeks may separate the experts’ testimony, the panel approach enables the judge to compare and consider the competing opinions on a fair basis.” (quoting the Australian Federal Court)); Stockton, *supra* note 59, ¶¶ 13–14; Wood, *supra* note 68, at 96.

A third benefit of the hot tub is the physical placement of the experts. Placing experts at one table, or in the same witness box, both downplays the adversarial relationship between the experts imposed by the litigation⁷⁵ and emphasizes the “proper role” of the experts: to provide their unbiased expert opinion on the issue at hand.⁷⁶ As the Australian Federal Court noted: “There is . . . symbolic and practical importance in removing the experts from their position in the camp of the party who called them.”⁷⁷ Reducing the adversarial nature of expert examination also “‘release[s] the tension which normally infects the evidence gathering process’” and helps experts relax and focus on the substance of their testimony.⁷⁸ The conversational atmosphere of the hot tub is more familiar to most scientists than traditional examination and cross-examination methods, and the colloquial nature of the process bears closer resemblance to the discussions and debates they might have with their colleagues outside of the courtroom.⁷⁹ This helps facilitate discussion, allowing experts who are otherwise uncomfortable in the adversarial courtroom setting to relax and contribute more fully.⁸⁰ It also reduces the risk of one expert’s opinion appearing dominant solely because the expert is more at ease on the stand. This leveling effect is especially beneficial in cases where the complexity of the subject leaves the fact finder to rely on secondary factors immaterial to the validity of the science supporting the testimony when determining which opinion is most persuasive. Hearing the experts engage in a conversation with each other may also help judges and juries make this determination and is arguably more probative than other secondary factors used to decide which testimony is most credible.⁸¹

As mentioned above, the hot tub method is favored by experts over traditional procedures.⁸² Evidence suggests that experts prefer the

⁷⁵ See Heerey, *supra* note 8, at 391.

⁷⁶ Stockton, *supra* note 59, ¶ 15; see also, e.g., Bernstein, *supra* note 16, at 454 n.13.

⁷⁷ AUSTL. LAW REFORM COMM’N, REPORT 89, MANAGING JUSTICE: A REVIEW OF THE FEDERAL CIVIL JUSTICE SYSTEM § 6.117 (2000), available at <http://www.austlii.edu.au/au/other/alrc/publications/reports/89/ch6.html>.

⁷⁸ Wood, *supra* note 68, at 96 (quoting Australian Judge Peter McClellan) (alteration in original).

⁷⁹ See, e.g., Marvin J. Garbis, *Aussie Inspired Musings on Technological Issues—Of Kangaroo Courts, Tutorials & Hot Tub Cross-Examination*, 6 GREEN BAG 2D 141, 144 (2003).

⁸⁰ Wood, *supra* note 68, at 96.

⁸¹ See *id.*

⁸² E.g., ADMIN. APPEALS TRIBUNAL, *supra* note 67, at 8; Stockton, *supra* note 59, ¶ 15.

conversational nature of the hot tub over traditional witness examination methods because it “[fits] in much better with the way in which they normally [work].”⁸³ Hot tubbing moves the process “somewhat away from lawyers interrogating experts towards a structured professional discussion between peers in the relevant field.”⁸⁴ Not surprisingly, experts feel that this forum allows them to better express their opinions than when they are constrained by the traditional method of examination and cross-examination, where they can only answer questions directly posed to them by an attorney.⁸⁵ Experts also feel that this allows them to “respond more effectively to the views of the other experts.”⁸⁶ Furthermore, some experts who have testified in the hot tub “feel that there is less risk that their evidence will be distorted by the skill of the advocate.”⁸⁷ Overall, the “brief colloquium” of the hot tub is a closer match to the standard dialogue of experts than the traditional adversarial approach, which often seems “entirely alien to [experts].”⁸⁸

In addition to improving experts’ ability to express their opinions accurately, expert witnesses would seem to prefer the hot tub method because their professional organizations would likely support the procedural change.⁸⁹ In a world where experts who testify in court are often seen as “whores” who mold their opinions to suit the needs of the lawsuit, any procedural modification allowing them to express their views in a more favorable way to their profession in general is a welcomed change.⁹⁰

Finally, the hot tub method is praised for increasing judicial economy.⁹¹ While it is difficult to calculate exact monetary and time savings, the New South Wales Land and Environment Court reported that hot tubbing takes as little as half, or even twenty percent, of the time required by traditional methods.⁹² The method is especially

⁸³ Stockton, *supra* note 59, ¶ 15.

⁸⁴ N.S.W. LAW REFORM COMM’N, REPORT 109: EXPERT WITNESSES § 6.56 (2005), available at http://www.lawlink.nsw.gov.au/lawlink/lrc/lrc.nsf/pages/LRC_r109chp06.

⁸⁵ See, e.g., ADMIN. APPEALS TRIBUNAL, *supra* note 67, at 8–9.

⁸⁶ *Id.* at 8.

⁸⁷ *Id.*

⁸⁸ Stockton, *supra* note 59, ¶ 15.

⁸⁹ See Gross, *supra* note 29, at 1115.

⁹⁰ See *id.* (referring to the common perception of expert witnesses as whores).

⁹¹ E.g., Heerey, *supra* note 8, at 391; Stockton, *supra* note 59, ¶ 15; Wood, *supra* note 68, at 96.

⁹² ADMIN. APPEALS TRIBUNAL, *supra* note 67, at 8.

efficient when more than two experts are involved in the procedure.⁹³ In one Australian case involving a large number of parties and many experts testifying about geographic indices in viticulture, the initial estimated hearing time of six months was reduced to an actual hearing time of only five weeks through the use of the hot tub procedure.⁹⁴

In November 2005, the Australian Administrative Appeals Tribunal conducted a study examining the use of concurrent evidence in hearings in the New South Wales Registry.⁹⁵ The study gathered quantitative and qualitative data through surveys, file audits, and focus groups in order to examine the general effectiveness of hot tubs in real hearings.⁹⁶ This study went beyond listing hypothetical benefits of hot tubbing by providing actual data supporting many of the benefits outlined above.⁹⁷

B. Shortcomings of the Hot Tub Method

While hot tubbing enjoys significant support in Australian federal courts and has many ascribed benefits, it does not enjoy universal popularity. Some argue that, regardless of whether the hot tub or traditional methods are used, experts will be heavily prepped by the attorney and equally susceptible to bias.⁹⁸ Justice Geoffery L. Davies of the Queensland Court of Appeal argues that “expert[s] come] to the [h]ot [t]ub armed not merely as . . . expert witness[es] but as . . . expert advocate[s].”⁹⁹ Davies argues that, as a result, hot tubbing will not expose adversarial bias and will leave the finder of fact either with “two opposed but apparently convincing opinions by equally well-qualified experts, neither of them . . . shaken in the process . . . [or] unwittingly convinced by the more articulate and apparently authoritative personality.”¹⁰⁰ At worst, this depiction leaves the court in essentially the same position as traditional methods, with the testimony of biased experts controlled by each side’s advocate and

⁹³ N.S.W. LAW REFORM COMM’N, *supra* note 84, § 6.56.

⁹⁴ Downes, *supra* note 64, at 5.

⁹⁵ ADMIN. APPEALS TRIBUNAL, *supra* note 67, at 4.

⁹⁶ *Id.*

⁹⁷ *Id.* at 4–5; *see infra* text accompanying notes 110–19 (describing the results of the study).

⁹⁸ *See, e.g.*, Davies, *supra* note 66, at 398.

⁹⁹ *Id.*

¹⁰⁰ *Id.* at 398–99.

either a deadlock of disagreement or a choice based on secondary criteria rather than the validity of the experts' views.

Critics further argue that without a skilled moderator or judge willing to facilitate the hot tub, the informative discussions between professional colleagues tend to degrade into "unproductive squabbles."¹⁰¹ Furthermore, one expert stated that he has observed "hot tubs where neither expert had questions for the other and the court did not choose to intervene to save the situation."¹⁰² Although both of these problems are serious concerns, they are easily avoidable if judges are familiar with the procedure and willing to prepare before facilitating a hot tub in their court. In the unlikely event that neither expert has questions for the other, counsel may still proceed with standard direct and cross-examinations of each expert witness. In this scenario, the court would still benefit from some of the other advantages of hot tubbing, including contemporaneous examination of experts in the same room. If conversation between experts truly degenerates to "squabbles," a judge can easily step in and move the procedure along to the standard direct and cross-examination phase.

While advocates of the hot tub technique tout the procedure's efficiency, Davies disagrees and believes that the hot tub method seems "too cumbersome [and] too expensive."¹⁰³ Though efficiency is difficult to evaluate when only one method or the other can be utilized in any single instance, most accounts conclude that, in general, hot tubbing results in a net increase of efficiency.¹⁰⁴ Despite Davies's critique, hot tubbing has spread "to simpler cases for which the technique was not initially designed, principally for reasons of efficiency."¹⁰⁵ Careful selection of cases that can benefit from hot tubbing can also help eliminate the chance of the procedure reducing economic and judicial efficiency.

While critics of hot tubbing point to certain weaknesses, it seems unlikely that the court would suffer a net loss of efficiency or be put in a worse position by using the hot tub rather than traditional methods, even in situations where the procedure's weaknesses would have the greatest impact. Overall, hot tubbing enjoys more supporters

¹⁰¹ Lisa C. Wood, *Experts Only: Out of the Hot Tub and into the Joint Conference*, ANTITRUST, Fall 2007, at 89, 92.

¹⁰² *Id.*

¹⁰³ Davies, *supra* note 66, at 399.

¹⁰⁴ See, e.g., Wood, *supra* note 68, at 96.

¹⁰⁵ *Id.*

than it suffers critics in Australia,¹⁰⁶ which strengthens the conclusion that, though imperfect, the method's advantages outweigh its flaws.

V

WHEN IS THE HOT TUB PROCEDURE APPROPRIATE?

In Australia, hot tubbing has been implemented in the federal courts as well as the New South Wales Land and Environment Court, the Administrative Appeals Tribunal, and the Australian Competition Tribunal.¹⁰⁷ While rules of evidence and procedure governing these courts and tribunals vary, factors considered in determining whether the hot tub should be used for a particular case appear substantially similar across jurisdictions.¹⁰⁸

The hot tub method has been used in Australia to facilitate expert testimony in many different fields, ranging from doctors testifying about various medical specialties, animal behavior specialists, accounting witnesses, viticulturists, and beyond.¹⁰⁹ While certain types of cases require expert testimony more frequently than others, the particular field of expertise does not play a major role in determining whether a hot tub is appropriate. As a result, no field of expertise has been labeled more hot tub appropriate than others, and any area of testimony prone to dueling experts is a candidate for hot tubbing procedures. Other important factors to consider may present themselves more frequently in certain disciplines, making hot tubbing more common in those disciplines than others, but no such correlation has been reported. In one Australian study examining the effectiveness of medical experts in the hot tub, presentation of psychiatric evidence in the tub received less favorable reviews than other areas of medical testimony.¹¹⁰ This was due, at least in part, to the fact that the "medical theory [was] not as black and white" as other areas of medicine.¹¹¹ This data both highlights difficulties that arise when experts reach different conclusions because theories are not "black and white" and is a source of difficulty regardless of whether expert testimony is given via traditional methods or in the hot

¹⁰⁶ *Id.*

¹⁰⁷ *E.g.*, ADMIN. APPEALS TRIBUNAL, *supra* note 67, at 7, 9.

¹⁰⁸ *See, e.g., id.* at 8 n.11.

¹⁰⁹ *See, e.g.*, ADMIN. APPEALS TRIBUNAL, *supra* note 67, at 10–11, 27; Downes, *supra* note 6, at 188; Heerey, *supra* note 8, at 391.

¹¹⁰ ADMIN. APPEALS TRIBUNAL, *supra* note 67, at 32–33.

¹¹¹ *Id.* at 33.

tub. Therefore, such reports are not necessarily indicative of the effectiveness of the hot tubbing method but rather reflect the challenges that arise from uncertainty in a given field.

While the subject matter of a case may not have a significant bearing on whether hot tubbing is used, characteristics of the experts themselves and the presiding judge are important. First, as expressed by members of the Australian Administrative Appeals Tribunal, it is important that experts have approximately the same level of expertise.¹¹² Disparities in expertise levels may create the “potential [for] a more junior expert [to] defer to the opinion of the more senior expert” in the conversational setting of the hot tub.¹¹³ Regardless of skill, some experts may be more suited for the hot tub based on their personality and speaking ability. The effectiveness of a particular hot tub discussion may be reduced if one expert is less comfortable speaking in this forum than the other. This problem, however, also exists in the traditional method of calling each expert to the witness stand individually. Thus, it is likely that the witnesses who are hindered by their discomfort in the hot tub would experience at least the same degree of discomfort on the stand.

Australian Administrative Appeals Tribunal members were asked to identify and rank the top reasons why a hot tub ought to be used in specific cases over which they presided.¹¹⁴ The top reason for electing to use the hot tub was that “[e]xperts have [the] same level of expertise.”¹¹⁵ This was followed—in order of importance—by “[e]xperts would be commenting on the same issues,” “[concurrent evidence] will clarify some complex issues,” and “[concurrent evidence] will improve the objectivity of evidence presented.”¹¹⁶ These results suggest that when considering whether to utilize the hot tub procedure, the qualifications of experts themselves are just as important, if not more so, than the particular field of expertise at issue.

The Australian Administrative Appeals Tribunal also explored why tribunal members chose not to utilize the hot tub in certain instances.¹¹⁷ Several commonly stated reasons included that

¹¹² *Id.* at 29.

¹¹³ *Id.* at 32.

¹¹⁴ *Id.* at 29.

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ *Id.* at 30.

“[e]xperts do not have [the] same level of expertise” and “[e]xperts would not be commenting on the same issues.”¹¹⁸ These mirror the two highest ranking factors why experts should be subjected to the hot tub, emphasize the importance of the factors, and indicate consistency in the factors considered important by tribunal members. Furthermore, by ranking these as the most dominant reasons why the hot tub method was not used, members implied that these factors sometimes serve as deal breakers in deciding whether or not the hot tub method is appropriate in a given case. Other reasons reported for why the hot tub method was not used included practical reasons such as scheduling conflicts among the experts.¹¹⁹

In addition to the characteristics and personalities of the expert witnesses in the hot tub, the presiding judge also plays an important role in assuring the procedure’s success. As the moderator of the discussion, the judge can positively impact the procedure by ensuring that controversies at issue are identified and discussed.¹²⁰ This may require a significant amount of preparation by the judge, who must also ensure the free flow of ideas in the tub and that each participant has an adequate opportunity to ask questions and state any views.¹²¹ Because of the preparation and active participation required on the part of the judge, a judge should not attempt to facilitate a hot tub discussion if he or she does not want, or is not prepared, to serve as the hot tub’s moderator.

VI

HOT TUBS AND SCIENTIFIC EXPERT TESTIMONY

As mentioned above, applicability of the hot tub method has generally been determined on a case-by-case basis by considering factors intrinsic to the experts themselves, their testimony, and the ability of the presiding judge to serve as an effective moderator. Scientific evidence, however, presents unique challenges in the courtroom and is frequently plagued by dueling experts. Do these unique aspects make scientific testimony more or less fit for the hot tubbing process, or, relatedly, are scientific disputes too complex to be heard in this less formal forum?

¹¹⁸ *Id.* at 31.

¹¹⁹ *See id.*

¹²⁰ Cheeseman, *supra* note 8, at 55.

¹²¹ *Id.* at 55–56.

One common frustration when scientists take the witness stand is the disconnect between the language of science and the language of law. Many, if not all, laypeople find the jargon and terms of art used by attorneys during trial frustrating and hard to follow. Without legal training, knowing exactly what is meant by a phrase like “clear and convincing,” or even recognizing that it is a term of art, is challenging. Likewise, scientists have their own jargon that is unfamiliar to most nonscientists and does not match up with the legalese of the courtroom.¹²² This linguistic disconnect is particularly problematic when a scientist takes the stand as an expert witness. Because the average scientist is not fluent in the courtroom language of the questioning attorney, there is a risk that the scientist will not understand an attorney’s question with the precision the scientist’s discipline demands. When the expert answers what is believed to be the attorney’s question, the attorney must quickly translate the scientific answer into an understandable form and analyze it according to the law. This disconnect between scientists and lawyers creates the risk of misunderstanding important nuances of the questions posed and the responding testimony.

Standards of proof provide a good example of how such “lost in translation” problems might arise.¹²³ For scientists, “[s]tatistics gives [the] tools to accept conclusions that have a high probability of being correct and to reject conclusions that do not.”¹²⁴ Lawyers, on the other hand, do not speak in the mathematical terms of confidence intervals and degrees of freedom, but rather in terms of art like “preponderance of the evidence” and “beyond a reasonable doubt.” The disconnect between these two modes of expression is clear. Which confidence interval might a scientist equate to a reasonable doubt? This example is especially pertinent as scientific uncertainty often plays a major role in legal disputes, and “understanding . . . the degree of uncertainty associated with particular assertions of scientific fact” is crucial to evaluating the merits of each side’s arguments.¹²⁵

¹²² See, e.g., Charles Weiss, *Expressing Scientific Uncertainty*, 2 L., PROBABILITY & RISK 25, 25 (2003) (identifying this disconnect and proposing a scale that matches a range of scientific uncertainty levels to various “standards of proof recognized in the US legal system”). “The scale is intended as a tool to help increase the precision and rationality of discourse in controversies in which generalists untrained in natural science must judge the merits of opposing arguments in disputes among scientific experts.” *Id.*

¹²³ See, e.g., *id.*

¹²⁴ DANIEL C. HARRIS, QUANTITATIVE CHEMICAL ANALYSIS 61 (6th ed. 2003).

¹²⁵ Weiss, *supra* note 122, at 25.

Each time necessary translations are made between the attorney and scientist, critical information might be lost. In a hot tub, however, when two scientists can speak to each other directly and without filtering questions and responses through an attorney, the risk of testimony being misunderstood or distorted is reduced.

VII

HOT TUBS IN THE UNITED STATES

The net balance of benefits of the hot tub procedure, including its potential to alleviate some of the difficulties associated with complex scientific testimony, entice a closer examination of the method's potential application in the United States. Identifying key similarities and differences between the Australian and American judicial systems is essential to assess both the procedure's applicability within the United States and how it might be adapted for American courtrooms.

Similar to the American judiciary, Australian courts employ a system of adversarial expert testimony by relying on each side to hire and present the testimony of its own experts. Furthermore, "Australian federal judges, like their American counterparts, are judicial generalists called upon to resolve cases presenting cutting edge technological issues."¹²⁶ As a result, judges in Australia encounter similar frustrations arising from dueling expert testimony to those that plague American courts. Thus, methods explored and developed in Australian courts to combat issues surrounding expert testimony may likely have applications in the United States. The judiciaries of Australia and the United States, however, are not identical. A few major differences deserve special consideration and may necessitate the modification of Australian-born solutions.

First, Australian federal courts do not hear criminal trials.¹²⁷ The hot tub method may need significant adjustments before being used in any criminal trial to address heightened concerns of due process and other rights of the criminal defendant.¹²⁸ Second, and more significantly, juries are not utilized in the Australian federal court system.¹²⁹ As a result, hot tubbing has not been used in an Australian

¹²⁶ Garbis, *supra* note 79, at 142.

¹²⁷ *E.g., id.*

¹²⁸ Because the Australian judiciary has not implemented the hot tub procedure in a criminal trial, this discussion of the method's use in America will focus solely on civil cases.

¹²⁹ *E.g.,* Garbis, *supra* note 79, at 142.

jury trial. The introduction of the jury represents the most significant hurdle that the Australian hot tub method faces in American courts.

Contrary to Australian practices, American civil trials are frequently heard in front of a jury. In a bench trial, the judge can participate in hot tub discussions as both a judicial moderator and the finder of fact. This allows the finder of fact in the trial to directly question each expert as evidence is presented. When a jury serves as the finder of fact, serious procedural and practical obstacles arise that do not exist in a bench trial. These obstacles essentially bar the jury from directly questioning experts and restrict one of the major benefits of the hot tub procedure.

Juror questioning of witnesses must adhere to strict guidelines that vary between U.S. jurisdictions. While some jurisdictions do not allow jurors to question witnesses at all, others require that jurors submit their questions in writing so each party may review and object to a question before it is posed to the witness.¹³⁰ This procedure would be very tedious if the jury had more than a few simple questions and would do away with much of the efficiency and relative informality associated with the hot tub. Furthermore, questions submitted by jurors are subject to the same rules of evidence that apply to questions posed by attorneys when examining an expert witness.¹³¹ Unlike attorneys, jurors are not versed in evidentiary rules and do not understand the nuances of framing fair, unobjectionable questions. Questions posed by a layperson, without the guidance of someone trained in the rules, would likely lead to objections and bog down hot tub procedures. Even if this economical hindrance were tolerated, strings of impermissible questions could have an unduly prejudicial effect on the jury, regardless of whether the judge instructed the jury to disregard any submitted questions rejected due to counsels' objections.¹³²

Practical concerns also arise from the sheer number of jurors who may want to participate in the hot tub by questioning a witness. All other evidentiary and procedural concerns aside, up to twelve individuals asking questions of two or more experts testifying about complex and controversial scientific evidence could easily slide into pandemonium. Without a heavy dose of judicial control, the procedure would likely degrade the discussion among experts beyond

¹³⁰ 98 C.J.S. *Witnesses* § 428 (2002).

¹³¹ *Id.*

¹³² 75B AM. JUR. 2D *Trial* § 1379 (2007).

any reasonable level of productivity. Methods to manage juror questioning would likely be laborious and risk muting any efficiency arguments of the hot tub. Practically speaking, there is simply not enough room in the hot tub for an entire jury.

VIII

POSSIBLE MODIFICATIONS OF THE HOT TUB PROCEDURE

America's use of juries, however, need not exclude the hot tub procedure from U.S. courtrooms. Various modifications and adaptations can facilitate use of the hot tub in the United States during different stages of litigation. While even modified versions of the traditional hot tub procedure will likely remain problematic when conducted in the presence of a jury, versions of the procedure may be successfully used in American bench trials and various pretrial proceedings.

A. Jury Trial Hot Tubs Without Juror Participation

A brief examination of the implications of inviting a jury into the hot tub exposes the reality that hot tubs in the context of a jury trial must exclude the finder of fact. While this eliminates the advantage of being able to question experts directly, the hot tub may still be a useful tool in jury trials without juror participation. The benefits of efficiency, increased comfort levels of experts, contemporaneous examination, and quick reduction of the issues to key areas of dispute would all remain.

However, legitimate concerns still arise from a jury listening in on a hot tub discussion between counselors, experts, and the judge, as concerns over the propriety of questions arise when experts pose their own questions. Just like those posed by jurors, questions asked by experts in normal hot tub discussion are unlikely to conform to evidentiary rules. If counsel were to object to each nonconforming question, the effectiveness of the hot tub would be greatly reduced if not eliminated. In a bench trial, where hot tubs are traditionally utilized, the judge acts as the finder of fact and is also familiar with evidentiary requirements for examination questions. As such, the judge can identify aspects of questions that are objectionable and disregard aspects that are unduly prejudicial. In nonjury trials where hot tubs are used, counsel for each party must trust the judge's ability to evaluate the questioning and resulting testimony appropriately. Jurors, however, are not trained to filter testimony that would or

would not be admitted as evidence under traditional examination methods where formal objections are made to all nonconforming questions. The prejudicial effect of the jury listening to the experts' objectionable questioning may outweigh the significant benefits associated with the hot tub. Thus, even when jurors are excluded from actively participating, conducting a hot tub in front of a jury still raises significant concerns.

B. Use in American Bench Trials

As in Australia, the hot tub may, and should, be utilized in American bench trials. Bench trial use of the hot tub eliminates the procedural concerns of a jury while preserving the benefits of the hot tub. In light of the judiciary's and expert witnesses' continued and long-standing frustration with the current mode of expert testimony, motivated judges should initiate trial runs of the Australian-born hot tub procedure for bench trials in their courtrooms. The likelihood of the hot tub's success in the United States depends on judges who are willing to experiment with this new procedure in hopes of alleviating the long-recognized, yet unresolved, flaws of the current system of adversarial expert testimony. Initial uses of the hot tub in American bench trials will illuminate specific opportunities for further procedural modifications as well as the method's potential application in other stages of U.S. litigation. Given the substantial benefits of the procedure in Australian bench trials,¹³³ U.S. courts should experiment with the procedure during bench trials with suitable expert witness evidence.¹³⁴

C. Modification for Use in Pretrial Proceedings

In addition to using the hot tub in American bench trials, a modified version of the procedure may prove useful in U.S. pretrial procedures.¹³⁵ *Daubert* hearings, which occur before trial and are not subject to evidentiary rules, may prove to be an excellent venue for the hot tub. This modified version would closely resemble the

¹³³ See *supra* Part IV.A.

¹³⁴ See *supra* Part V (discussing factors that make particular cases suitable for the hot tub method).

¹³⁵ This modification of moving the hot tub to pretrial procedures is only appropriate where the identities of expert witnesses are revealed before trial. See Davies, *supra* note 66, at 398. In jurisdictions such as Oregon, where the identities of experts are kept secret until they are called to testify, there is still a possibility that the hot tub might be used before trial if all parties agree to reveal their expert witnesses in pretrial proceedings.

standard hot tub procedure and could significantly help the judge's efforts to identify merits and flaws of particular expert testimony, ultimately aiding in the determination of whether the testimony is admissible. Moving the hot tub to pretrial proceedings eliminates concerns arising from conducting the discussion in front of a jury while preserving many of the method's benefits. The hot tub's ability to narrow contested issues and clarify the root of experts' disagreements would aid judges' attempts to evaluate complex scientific testimony presented by opposing experts during *Daubert* hearings. Moving the hot tub to pretrial proceedings may render it less effective than its courtroom counterpart, however, as pertinent issues in the case might be less fully developed during pretrial stages than they are when experts are called to testify during trial. Even so, the colloquial format of the hot tub would at least begin to clarify and narrow the actual issues in dispute before a trial even begins. This alteration might raise the costs of standard pretrial proceedings; however, the benefits conferred by the hot tub method likely outweigh this cost increase.

The hot tub method could also be modified for use during pretrial depositions. This innovation would require experts suitable for an in-court hot tub to conduct a similar procedure, under oath, during a pretrial deposition. Experts and counsel would engage in discussion similar to traditional hot tub proceedings but facilitated by a moderator other than the judge. This significant modification to the Australian model removes the finder of fact from the discussion entirely and eliminates problems predicted to arise in jury trials. Moving the procedure to the pretrial deposition would also avoid issues of conforming to evidentiary rules. Though this procedure would likely require a moderator to facilitate the discussion, resulting in an initial cost increase, the benefits conferred by this procedure could easily make up for added costs. Significantly, using the hot tub in pretrial depositions would allow experts to converse with one another directly, efficiently narrow the issues in dispute, and reduce the time needed to present their views during trial. The procedure may also increase the comfort of expert witnesses by allowing them to be deposed in a more familiar setting.¹³⁶ Furthermore, identifying the points of contention between experts' testimonies during pretrial depositions may decrease the adversarial tension often experienced by

¹³⁶ See *supra* text accompanying notes 82–88 (discussing increased comfort levels of experts in the hot tub setting).

experts during courtroom examination. Ideally, this method would result in experts either agreeing on, or possibly stipulating to, undisputed points, thereby reducing what ought to be further examined during trial to clearly disputed issues, which would increase efficiency.¹³⁷

CONCLUSION

The Australian-born hot tubbing method is an innovative approach to the longstanding and systemic problems of adversarial expert testimony. Although arguably less than perfect, hot tubbing boasts significant advantages over the traditional method of direct and cross-examination, while still preserving the benefits associated with each party providing their own expert testimony. These benefits and the preservation of multiple expert viewpoints are especially appealing when expert testimony concerns complex scientific findings or conclusions. Though significant differences between the American and Australian judiciaries prevent a seamless integration of the hot tub procedure into American courts, the procedure could be adapted for use in the United States. Whether modified for use in pretrial depositions, *Daubert* hearings, or adopted substantially unchanged for U.S. bench trials, many of the beneficial attributes of the Australian hot tubbing method would survive the adaptations necessary for use in U.S. courts. Thus, while significant modifications may be required, the basics of Australian hot tubs may be imported to the United States, providing significant improvements in the presentation and evaluation of scientific expert testimony.

¹³⁷ It is important to remember that the primary purpose of depositions is to gather information relevant to each party's claim or defense. Thus, depositions are not an appropriate venue for either adversarial disputes among counsel and their experts or a form of mini-trial to declare the validity of the experts' opinions. These situations can be avoided if the intended colloquial nature of the hot tub is adhered to and the goals of the procedure are established as both determining the opinions of each expert and pinpointing where such opinions overlap. These goals conform to the information-gathering purpose of depositions and may serve as a more efficient way to narrow the experts' testimony to the disputed issues.