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Session 203 | Incorporating Science, As Scientists Practice It, Into Patent Law: A Conversation With Judges

As Justice Breyer wrote, "[i]n this age of science, science should expect to find a warm welcome, perhaps a permanent home, in our courtrooms. . . . Our decisions should reflect a proper scientific and technical understanding so that the law can respond to the needs of the public." Scientific issues permeate the law, nowhere more so than in patent cases. Judges, however, are typically generalists without scientific expertise. Our panelists will discuss their experiences with difficult cases where there are grey areas in both the law and the science. The panelists will also address how to strengthen the court and jury's ability to consider science in the courtroom, including ways to improve the quality of expert testimony, the use of court-appointed scientific experts, the role of amicus briefs on scientific issues, and how judges perform their duty as gatekeepers with respect to scientific evidence. Further, the panel will address effective courtroom advocacy, including issues raised by generational differences. The panel will also touch on each panelist's journey to becoming a judge. Beyond inspiring attendees, the panelists hope to inform the Portrait Project 2.0's consideration of issues such as the relatively small number of APA judges and minority law clerks. We appreciate the support and guidance of NAPABA's Intellectual Property Committee and Portrait Project 2.0 in organizing and shaping this panel.

Moderator:
Jill Schmidt, *Assistant General Counsel, Genentech, Inc.*

Speakers:
Hon. Raymond Chen, *Circuit Judge, U.S. Court of Appeals for the Federal Circuit*
Hon. Michael Kim, *Acting Vice Chief Judge, Patent Trial and Appeal Board, USPTO*
Hon. Lucy Koh, *District Judge, U.S. District Court for the Northern District of California*
Hon. George Wu, *District Judge, U.S. District Court for the Central District of California*

2020 NAPABA Virtual Conference

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Moderator: Jill J. Schmidt, Genentech, Inc.

AGENDA

- Introductions
- Scenarios/hypotheticals: science as presented in patent cases
- Practical tips

INTRODUCTIONS

SCENARIOS / HYPOTHETICALS

TECHNOLOGY TUTORIALS

- Timing
  - Tutorials before vs. during *Markman* hearings? Earlier?
- Content
  - Claimed invention vs. accused technology? Key prior art?
  - Live presentations vs. submitted materials?
  - Slides vs. animations/interactive files?
- Speaker
  - Lawyers vs. experts?
  - Opportunities for junior attorneys?

CLAIM CONSTRUCTION / INFRINGEMENT

Scenario 1:

- Patent claims a method of purifying proteins with a non-affinity separation matrix. The parties disputed whether the claimed "washing" & "eluting" steps were met.

How can parties help the court understand the meaning of disputed claim terms to a person of skill in the art?

How should the court evaluate whether claim limitations are met, either literally or when applying the function-way-result test for the doctrine of equivalents?

See Amgen Inc. v. Sandoz Inc. 923 F.3d 1023 (Fed. Cir. 2019).

PATENT-ELIGIBILITY (§ 101)

Scenario 2:

- Patents claim "methods of modifying toolbars that are displayed on internet-connected devices such as personal computers." Defendants moved for judgment on the pleadings that the claims are directed to patent-ineligible subject matter.

See MyMail, Ltd. v. ooVoo, LLC, Nos. 5:17-cv-04487-LHK & 5:17-cv-04488-LHK (N.D. Cal. May 7, 2020).

Scenario 3:

- Patents are directed to various methods of displaying and distributing content on mobile devices, e.g., information about unread messages. Defendants filed 12(b)(6) motions arguing that the claims are directed to patent-ineligible subject matter.

See BlackBerry Ltd. v. Facebook, Inc., No. 2:18-cv-01844-GW-(KSx);
BlackBerry Ltd. v. Snap Inc., No. 2:18-cv-02693-GW-(KSx) (C.D. Cal. Aug. 18, 2018).

How should courts evaluate whether the claimed inventions are abstract or if the limitations recite anything beyond what is well-understood, routine and conventional?

INVALIDITY (§§ 102 & 103)

Scenario 4:

- Patent claims pharmaceutical compounds used for pain relief, specifically “highly pure morphinan-6-one products.” The parties stipulated to infringement but disputed whether claims were obvious.

How can parties help the court understand what is disclosed by the prior art and whether a person of skill would have been motivated to combine references or had a reasonable expectation of success?

See Endo Pharms. Inc. v. Actavis LLC 922 F.3d 1365 (Fed. Cir. 2019).

OBVIOUSNESS-TYPE DOUBLE-PATENTING

Scenario 5:

- Patents claim etanercept (i.e., a p75 TNFR/IgG1 fusion protein) and methods of making it. The parties disputed, *inter alia*, whether the patent should be invalidated as an "obvious variant" of a p55 TNFR/IgG1 fusion protein claimed in a commonly owned patent.

How can parties help the court evaluate whether the patents-in-suit are patentably distinct from the asserted double patenting references?

See Immunex Corp. v. Sandoz Inc., 395 F. Supp. 3d 366 (D.N.J. 2019), *aff'd Immunex Corp. v. Sandoz Inc.*, No. 2020-1037 (Fed. Cir. July 1, 2020).

ENABLEMENT / WRITTEN DESCRIPTION (§ 112)

Scenario 6:

- Patent claims are directed to methods of treating hepatitis C virus (HCV) by "administering an effective amount of a purine or pyrimidine β-D-2′-methylribofuranosyl nucleoside or a phosphate thereof, or a pharmaceutically acceptable salt or ester thereof."

How does the court determine whether a person of ordinary skill needed undue experimentation to identify which subset among billions of potential 2′-methyl-up nucleosides would be effective in treating HCV?

See Idenix Pharms. LLC v. Gilead Scis. Inc. 941 F.3d 1149 (Fed. Cir. 2019).

INVENTORSHIP (§§ 102(f) & 256)

Scenario 7:

- Patents are directed to methods of treating cancer with antibodies that target the PD-1 receptor or its PD-L1 ligand.

How does the court evaluate the scientific significance of contributions made by alleged co-inventors?

See Dana-Farber Cancer Institute, Inc. v. Ono Pharm. Co., Ltd. (Fed. Cir. July 14, 2020).

DAUBERT MOTIONS

Scenario 8:

- Plaintiff asserts infringement of patents directed to methods of manufacturing electric vehicles.

Would qualified experts be limited to those who have worked in industry?

What if the patentee is a pioneer in the field and there are no other "experts"?

Where should courts draw the line between academics working in the same field vs. closely-related fields?

PRACTICAL TIPS

EFFECTIVE COURTROOM ADVOCACY

- Briefing vs. oral argument
- Jury trials vs. bench trials
- Use of court-appointed technical experts

ADVICE FOR JUNIOR ATTORNEYS

- Stay curious
- Find a mentor
- Make goals…but be flexible

Scientists as Experts Serving the Court

Daniel L. Rubinfeld & Joe S. Cecil

Abstract: Our courts were not designed to consider the increasingly complex scientific and technical evidence needed to resolve contemporary legal disputes. Moreover, when conflicting evidence requires an understanding and interpretation of scientific or technical issues, allowing the parties to control the presentation of evidence places great strain on the judge and jury. This essay describes and evaluates three prototypical procedures that allow courts to appoint scientists and other experts independent of the parties to assist the court: 1) The appointment of an expert to advise the court and the parties regarding a disputed scientific issue by testifying in open court and being cross-examined by the parties; 2) The appointment of a "technical advisor" who assists the judge regarding scientific issues in much the same way that a law clerk assists regarding legal issues; and 3) The appointment of a special master who takes responsibility for the resolution of a portion of the case and prepares a written report for consideration by the court.

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Our courts were not designed to consider the increasingly complex scientific and technical evidence needed to resolve contemporary legal disputes. The common law tradition of the United States relies on the litigating parties to structure the presentation of evidence by selecting witnesses and allows them in some measure to shape their evidence presentation to their own advantage. While there are limits on the extent to which this can be done with ordinary witnesses, there is far greater leeway in shaping the evidence presented by expert witnesses. Indeed, if a party does not like what one retained expert has to say, the party need not call that expert and can instead present another expert whose testimony better supports the party's case. In most instances, the opposing side and the factfinder will not even know that another expert had been consulted. Similarly, cross-examination by the opposing party is supposed to identify weaknesses in opposing witness testimony by revealing inconsistencies, showing flaws in opportunities to observe, and revealing biases and other motives to deceive. Juries and judges are expected to understand

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the points being made. Experts, however, typically know considerably more than opposing counsel about the matters they discuss in their testimony, and jurors and judges typically know even less. Some experts are experienced witnesses selected in part for their proven success in withstanding cross-examination and persuading judges and jurors to their side. Others may be novices, inexperienced in giving testimony, who communicate poorly to the jury or are easily flustered by a cross-examiner, even if their science is sound.

After hearing the evidence, judges and juries render judgments, sorting out, to the best of their abilities, the conflicting evidence presented by the parties. This common law tradition ensures that the parties are given a full and fair opportunity to present their strongest case and appears to work well when conflicting evidence involves issues within the common knowledge and experience of the judge and jury. But when conflicting evidence requires an understanding and interpretation of scientific or technical issues, allowing the parties to control the presentation of evidence places great strain on both the judge and jury. Few judges and juries arrive in the courtroom with the knowledge and experience necessary to resolve patent disputes over new genetic technologies or antitrust disputes involving the proper specification of a commercial market. Hence the parties' expert witnesses are critical to understanding and resolving the scientific and technical issues that may lie at the heart of the dispute; weaknesses in the adversary system's capacity to deal with experts threatens both accuracy and justice.

Judges have an affirmative duty to ensure that expert testimony is scientifically valid and reliable, and modern courts often face motions to exclude proffered expert testimony because it lacks a proper foundation in scientific practice.[1] Yet without some form of assistance, judges and juries are unlikely to know if such testimony is consistent with the scientific consensus, and they may have great difficulty determining the proper weight to give the views of the opposing experts. If the parties' experts are unable or unwilling to educate the court regarding their areas of agreement and disagreement, the resulting court decision may be at odds with the current understanding of the scientific community and, in the extreme case, may be based on methods or theories for which there is no respectable scientific support.

Judges and juries are not helpless when faced with complex scientific evidence, however. As indicated by Nancy Gertner and Joseph Sanders in their essay in this volume, over the years judges have developed procedural techniques that have strengthened their ability to assess the foundation of expert testimony and clarify its complexities.[2] Nevertheless, in some cases, evidence is so complex that commonly available procedural devices are inadequate to provide judges and juries with a sufficient understanding of the conflict to allow a reasoned and principled decision. It is in those extraordinary circumstances that a judge should consider going beyond the common law tradition and seek the assistance of an expert appointed by the court and not sponsored by the parties.[3]

Judges and attorneys are well aware of the problems that expert testimony presents in a common law system.[4] A 1999 survey of federal judges and attorneys found that, in their view, the most frequent problem by far with expert testimony is that "[e]xperts abandon objectivity and become advocates for the side that hired them."[5] The third and fourth most frequent problems are that "[e]xpert testimony appears to be of questionable validity or reliability" and "[c]onflict among experts [is presented] that defies reasoned assessment."[6] Expert witnesses' abandonment of objectivity, becoming advocates for a party, and offering

invalid scientific testimony are facilitated, if not encouraged, by the parties' ability to select and shape the expert testimony that most favors their interests. While there are benefits to giving parties their choice of experts and a role in presenting their experts' testimony, it is difficult to defend practices that so frequently limit the opportunity for judges and juries to reach a reasoned and principled resolution of a dispute among scientific experts.

The most obvious alternative to the common law practice is to submit disputes regarding the scientific evidence to one or more independent scientists for resolution. In fact, in 1967, physicist Arthur Kantrowitz suggested the development of a "science court" composed of scientists and other experts that would resolve scientific conflicts that arose in the context of public discourse, including in litigation.[7] The science court proposal sought to distinguish scientific issues from other disputed issues in the litigation and to submit the scientific issues to an advisory committee that would resolve the scientific conflict. These findings would then be incorporated into the legal proceeding and guide resolution of the remaining nonscientific issues.

The science court proposal was widely discussed in the 1970s, and was the focus of a task force report of the White House Office of Science and Technology Policy.[8] Some critics questioned whether it was possible to separate scientific facts from the legal, political, and moral issues that may arise in disputes. Others thought such a procedure might stifle scientific debate. Despite the endorsement of the task force report and the support of a number of scientific organizations, the proposed science court was never tested.[9] Changes in political administrations and lack of funding doomed the proposal, and attention turned to other forms of adjudicating disputes over scientific issues.

In the succeeding years, other procedures to allow independent scientists to assist the courts have been developed. In this essay, we describe three prototypical procedures that allow courts to appoint scientists and other experts who are independent of the parties to assist the court. The first and most widely known procedure is described in Rule 706 of the Federal Rule of Evidence and related state court rules. This rule allows the court to appoint an expert to advise the court and the parties on scientific matters by testifying in open court subject to cross-examination by the parties, in the same way party experts can be examined. The second procedure is court appointment of a "technical advisor" who assists the judge regarding scientific issues in much the same way that a law clerk assists regarding legal issues. This alternative is especially useful for cases in which a judge must master a complex body of knowledge in order to render a decision. Last, a court may appoint a special master who takes initial responsibility for the resolution of the portion of the case involving scientific issues and prepares a written report for consideration by the court. Special masters are typically appointed to deal with accounting tasks or the computation of damages in complex cases, but in extraordinary circumstances, scientists or engineers have served as special masters to assist the court in resolving disputes over patent claims or to supervise discovery of technical information, such as computer source code. Each of these three alternatives is a compromise intended to strengthen the ability of the judge and jury to resolve disputes over scientific issues within the broad confines of our common law tradition.[10]

Experts appointed in accordance with Federal Rule of Evidence 706 are chosen by the judge following consultation with both parties, with expert fees and other costs typically borne equally by both sides.

The principal role of court-appointed experts is to give expert testimony.[11] The expert is expected to prepare an expert report (oral or written) based on the available evidence and, as the case proceeds to trial, to be available for depositions and cross-examination by counsel for both parties. Appointment of experts by the federal courts under Rule 706 is rare. A 1993 study by the Federal Judicial Center found that only half of the federal district court judges had ever appointed a Rule 706 expert, and only half of those had appointed an expert on more than one occasion.[12] Nevertheless, an appropriately managed expert role can be highly beneficial to the court, although there remain some concerns.[13]

On the positive side, court-appointed experts can clarify fundamental issues addressed by the parties' experts and diminish the extent to which the court must rely on their testimony, perhaps securing agreement on undisputed facts from these experts or otherwise eliminating the need for them. Narrowing the role of the partisan experts may not only save costs; it may also diminish any concerns that the judge or jury must rely on "hired guns" who are paid to take a position. More important, the conclusions of a court-appointed expert may encourage settlement or provide better grounding for the outcomes in cases that go to trial.

Court-appointed experts facilitate settlements by offering a more "neutral" evaluation of the issues in the case, decreasing the possibility that the parties will cling to extreme positions. Whether the expert suggests an appropriate outcome or simply presents an accurate characterization of the views of the two parties, the expected value of a case is likely to be different and more certain than it would be without the expert. These changes will typically enhance the likelihood that a case will settle.[14]

Among the roles the court may define for an appointed expert are any or all of the following. First, the expert can brief the trier of fact (the judge or the jury) on foundational scientific and technical concepts that underlie the dispute between the parties. Second, the expert can assist the judge in determining whether the party expert's testimony is sufficiently grounded in sound science to be admissible by impartially summarizing the available research and informing the court of the extent of scientific consensus on an issue of import. Third, the expert can provide a conceptual framework that aids the judge and jury in assessing the validity of the different opinions offered by the parties' experts. Finally, and most significant, the presence of a court-appointed expert can change the incentives of the partisan experts for the parties. Knowing that their work will be scrutinized by a highly qualified neutral expert appointed by the court, partisan experts are likely to give more focused testimony that is more firmly based on a solid scientific foundation.[15] This will not only increase the likelihood of settlement, but, when cases do not settle, can also lead to scientifically sounder decisions by the trier of fact.

There is, of course, no free lunch with the appointment of a neutral expert. First and most obvious is the increased costs in time and effort to the parties and to the court itself. Depending on the area of needed expertise, there may be substantial controversy as to the set of appropriate skills and qualifications of potential appointees. The court must then identify a suitable expert, screen the expert for conflicts of interest, and secure compensation for the expert from the parties. Additionally, it takes time to instruct the court-appointed expert on the tasks the expert must accomplish and to allow the appointed expert to become familiar with the issues in dispute. The parties must also spend time considering and responding to the findings and testimony of the appointed expert. These additional time and effort costs, along with

the expert's fees, translate into dollar costs that must be paid by the parties. Depending on what is in dispute, it may be difficult for a judge to justify these costs in a given case, and even harder for lawyers to justify the presence of court-appointed experts to their clients, especially when participation by an appointed expert could weaken their case.

Second, court-appointed experts may undermine the authority of the judge or jury by acquiring an unentitled "aura of infallibility." In the extreme, if not appropriately cabined, the expert could take over the judicial role by framing the resolution of scientific and technical issues in ways that intrude on the authority of the judge to interpret the law. While this is an unlikely possibility, the prospect that the lawyers for the parties may lose some control over presentation of their case may be a valid fear. Judges and juries are likely to discount the views of the parties' experts when their views are in conflict with those of an expert appointed by the court, since the views of the court-appointed expert are likely to be regarded as free of partisan bias. But partisan bias is not the only bias that may affect an expert's testimony. In some areas, disciplines are divided about the weight or quality of available evidence or the import of theory. A court-appointed expert may belong to one school of thought rather than another and this debatable intellectual bias may shape what the jury hears.

If, however, the court-appointed expert's role is well-defined and appropriately cabined, we do not see these concerns as outweighing the opportunity for factfinders to reach more informed judgments based on sound scientific concepts.[16] For example, in *Monolithic Power Systems v. O2 Micro International*, the United States Court of Appeals for the Federal Circuit ruled that the district court did not abuse its discretion in appointing an expert under Federal Rule 706.[17] With respect to the appointment of electrical engineer Enrico Santi as a neutral expert, the court noted:

> The predicaments inherent in court appointment of an independent expert and revelations to the jury about the expert's neutral status trouble this court to some extent. Courts and commentators alike have remarked that Rule 706 should be invoked only in rare and compelling circumstances. *In re Joint E. & S. Dists. Asbestos Litig.*, 830 F. Supp. 686, 693 (E.D.N.Y. 1993) (noting that "use of Rule 706 should be reserved for exceptional cases in which the ordinary adversary process does not suffice"); Wright, *supra*, § 6302 ("Rule 706 powers are properly invoked where the issues are complex and the parties' experts have presented conflicting testimony that is difficult to reconcile or have otherwise failed to provide a sufficient basis for deciding the issues."). However, under Ninth Circuit law, district courts enjoy wide latitude to make these appointments. This court perceives no abuse of discretion in this case where the district court was confronted by what it viewed as an unusually complex case and what appeared to be starkly conflicting expert testimony.[18]

As an illustration of the use of a court-appointed expert, consider the Glass Containers Antitrust Litigation.[19] The plaintiffs brought an antitrust price-fixing case against the major manufacturers of glass containers and sought to certify a single, national class that included all direct purchasers of manufactured glass containers. In order to certify such a class, the plaintiff was required to show that the class members suffered similar damages.[20] In opposition to class certification, the defendants' economic expert argued that there was substantial price variation among different types of glass containers and that the price variation was evidence that any harm that might have been suffered by putative class members would have varied substantially among individuals. After fur-

ther discovery into manufacturing costs issues that both sides' experts had avoided, the court-appointed expert and coauthor of this essay Daniel Rubinfeld found that variations in glass container pricing were best explained by a series of pricing equations, each of which explained pricing for a different type of container (such as a wine bottle or a pickle jar). Ultimately, District Court Judge Ilana Rovner followed Rubinfeld's analysis by certifying a set of subclasses made up of a variety of types of glass containers. Although the litigation continued for some time, the eventual settlement of the case was driven in part by Rubinfeld's expert report.

Several aspects of the role of the court-appointed expert in this case are worth noting. First, the plaintiff's filing of a writ of mandamus, which questioned Judge Rovner's plan to appoint a court-appointed expert, was rejected by the Seventh Circuit Court of Appeals.[21] Second, Judge Rovner chose to have no *ex parte* contact with the court-appointed expert, a choice that avoided potential claims of bias on the part of the judge. Third, there is little doubt that, had the appointment of the neutral expert been made earlier in the litigation, the reports of the parties' experts would have been more focused on the central issues in the case.[22] Fourth, because the case involved substantial potential damages, the case was able to support focused expert discovery by the court-appointed expert, followed by his written report and oral testimony. Both sides responded at length in written replies, but chose to only minimally cross-examine the neutral expert's oral testimony at a court-directed hearing. This may have reflected the parties' fear of irritating Judge Rovner, who had made the appointment in the first place.

Another example is the extensive use Judge Kimba Wood made, over the plaintiff's objection, of court-appointed expert economist Alfred Kahn in *State of New York v. Kraft General Foods, Inc.*[23] At issue was the legality of Kraft's planned acquisition of Nabisco's cereal assets. At Judge Wood's request, the expert economists for both parties and Kahn appeared in court throughout the thirty-day bench trial. Not only opposing counsel but also Judge Wood and Kahn cross-examined each of the parties' experts on each of the fundamental merger issues in the case: market definition, market power, and competitive effects. In the end, Kahn testified as to his views of each of these issues and, in turn, was available for cross-examination by both parties.

Kahn's role (and the role of his associates) in this matter was no doubt influential. While it was costly to the parties, it had the effect of focusing the testimony of the experts on critical issues and clarifying portions of the experts' testimonies for Judge Wood. Perhaps due in part to the role of the court-appointed expert, the State of New York chose not to appeal Judge Wood's opinion in favor of Kraft.[24]

A more amorphous role for the neutral expert is as advisor to the court on technical issues. Although not authorized by a specific rule, judges have relied on the court's inherent authority to appoint technical advisors, who function more like law clerks than like testifying expert witnesses.[25] Technical advisors may function as "a sounding board" that can help the jurist to educate him- or herself in the jargon and theory that the parties' experts or presentations have referenced and to think through critical technical problems.[26] There are a number of advantages associated with this more limited role. First, the job is likely to be less time-consuming and expensive than the role of a testifying expert. Indeed, a technical advisor need not submit to a deposition or cross-examination by counsel for the parties.

Second, the expert can provide useful information for a court conducting a *Daubert*

hearing where the methodology or qualifications of one or more of the party-selected experts is challenged. In this setting, the technical advisor is aiding the judge in his or her role as gatekeeper. This may result in judicial rulings that either promote settlement or, on occasion, leave one party (almost always the plaintiff) without a case, saving the court as well as the parties time and money (even if one party is deeply disappointed with the result). Of course, there remains the danger that the expert will be unduly influential in determining the outcome of the case, as when a court precludes expert testimony and dismisses the case in a situation where a different neutral expert might have suggested to the judge that the *Daubert* hurdle had been cleared.

Third, the advisor can inform the judge about issues relating to data and methods, as well as help the judge devise plans for jointly agreed upon data sets or methodological approaches. Furthermore, because no testimony is planned, the court has substantial flexibility in its use of the expert. Indeed, if there is no testimony, the Rules of Evidence will not come into play. We see here a potentially valuable instructional role for the expert, for example, giving an unbiased tutorial to the court.

As with Rule 706 experts, there are concerns even when experts fill only this limited role. First, there is a possibility that the expert may go beyond the judge's remit and inappropriately influence the judge. Second, the expert's opinion may do little to help the parties converge on a settlement range and, in the end, not be cost-effective. Third, a substantial amount of information may be conveyed to the judge without the knowledge of or scrutiny by the parties. Indeed, there is no cross-examination of the technical advisor, contrary to the ideals of the adversarial system. For these reasons, a leading medical malpractice case warned that technical advisors should be "hen's-teeth rare" and should be used "only where the trial court is faced with problems of unusual difficulty, sophistication, and complexity, involving something well beyond the regular questions of fact and law with which the judges must routinely grapple."[27]

The difficult role of the technical advisor is demonstrated in the contentious case of *Association of Mexican-American Educators v. State of California*.[28] A number of minority educators filed a class-action lawsuit against the state, challenging the defendants' use of the California Basic Educational Skills Test (CBEST) as a requirement for certification to teach in California public schools. As part of this challenge, the plaintiffs questioned the validity of the test. After years of discovery concerning the development and application of the test, the court found that it needed guidance regarding a number of complex technical issues. The court then appointed Stephen P. Klein, an expert in test validation, as a technical advisor to the court. In the order appointing Klein, the court noted that it had come "face to face with many prickly problems requiring expertise in the esoteric fields of education and psychometrics including knowledge of theories about educational measurement and testing, cognitive psychology, statistics, and other fields pertaining to the CBEST and other cases." Klein was asked to review all of the expert testimony submitted in the case and to "confer *ex parte* with the Court from time to time." After considering the evidence, assisted by the assessments of Klein, the court found no violation of the Civil Rights Act. The plaintiffs objected to the *ex parte* nature of the court's communication with Klein. On appeal, the Ninth Circuit Court of Appeals upheld the appointment of the technical advisor and, in the absence of some indication of impropriety, did not object to the *ex parte* nature of the communication.[29]

The Federal Rules allow broad grants of authority to special masters to aid the

court. Under Federal Rule of Civil Procedure 53, the special master may perform any duties "consented to by the parties." Absent such consent, the appointed master may still address pretrial and posttrial matters that will assist the judge. In cases decided without a jury, the special master may go further and hold trial proceedings and make or recommend findings of fact regarding damages, the results of an accounting, or when there is an exceptional condition that warrants such assistance. In making such appointments, the court is expected to bear in mind the likely cost that will be imposed on the parties and any possibility of unreasonable delay.[30]

There are a number of benefits to the court and the parties flowing from a Rule 53 appointment. First, the appointment offers more flexibility for a judge than the appointment of a testimonial expert under Rule 706. The master's role might be sufficiently broad so as to provide judges with help for time-consuming tasks and, as a result, can shorten the litigation. Second, compared to the judge, a master who is responsible for only one case can more effectively deal with specific tasks such as monitoring long-term compliance or consent decrees. Third, a master can mitigate the possibility of judicial biases. Judges must pass on the admissibility of evidence, and even though they rule evidence inadmissible, their knowledge of the inadmissible evidence may color their decisions. A master can winnow admissible from inadmissible evidence so that judges are not exposed to the former. Fourth, expert masters, unlike most judges, have the time and special knowledge needed to receive and sort through reams of evidence to identify and organize the information that is of greatest consequence to a just outcome of the litigation.

By performing a variety of tasks, including damages calculations, the master can assist the judge with complex issues, while freeing up judicial resources, an important goal given the complexities of e-discovery in complex litigation. Moreover, with more time to focus on the qualifications of experts and determine where scientific consensus lies, a master can enhance the quality of *Daubert* evaluations, which can lead to quicker settlements or the dismissal of a case.

As with the approaches discussed above, there are, however, potential downsides to the use of masters. One is the cost to the parties who generally must pay the special master's fees. In addition, adding a role for a master into litigation can create delays that would not exist if the case were handled throughout by the trial judge, particularly since masters can take evidence sporadically, while, once a judicial trial begins, proceedings are most often more or less continuous. Moreover, the need to pay masters and their capacity to probe more deeply into a matter than a judge might on issues that arose pretrial or that might occur in party-controlled litigation can raise parties' costs, perhaps substantially. Finally, judicial authority and suggestions of judicial leanings are often an important incentive to settlement. Similar behavior by masters may have less clout.

Medtronic Sofamor Danek, Inc. v. Michelson offers an example of how the appointment of a scientist as special master may aid the court in dealing with discovery requests for complicated technical data.[31] The plaintiff sought discovery of electronic data that related to trade secrets, patents, and trade information in the field of spinal fusion medical technology. The requested information was contained on 996 network backup tapes, which included, among other things, the plaintiff's electronic mail and an estimated three hundred gigabytes of other, nonbacked-up electronic data. In light of the enormous amount of data that was to be procured, the judge appointed an expert trained in computer science and relat-

ed technologies as special master to oversee the electronic records production and to review the data files produced in response to discovery requests. The special master's duties included "making decisions with regard to search terms; overseeing the design of searches and the scheduling of searches and production; coordinating deliveries between the parties and their vendors; and advising both parties, at either's request, on cost estimates and technical issues."[32]

This case also offers an example of the need for care in defining the duties of and in monitoring the special master to avoid an improper delegation of judicial authority to a nonjudicial official. At the conclusion of five months of discovery, the plaintiff challenged the decision of the special master to withhold some of the tapes after finding that they did not contain deleted files. After the special master denied the plaintiff's request, the plaintiff sought review by the court. The court determined that the special master had exceeded his authority in denying the request, since the order of appointment did not include the duty of "making determinations as to whether Medtronic could be compelled to produce deleted files and e-mails."[33]

While there remain concerns about the use of court-appointed experts, whatever their capacity, we find the case for a more expansive role to be compelling. The more frequent use of such "neutral" experts seems particularly desirable given the increasing complexity of litigation in areas ranging from antitrust and intellectual property law to employment discrimination. We find particularly noteworthy the support this position has received from Supreme Court Justice Stephen Breyer and, more recently, from Circuit Court Judge Richard Posner.[34] According to Judge Posner,

> Turning to the technical statistical evidence …we recommend that the district judge use the power that Rule 706 of the Federal Rules of Evidence expressly confers upon him to appoint his own expert witness, rather than leave himself and the jury completely at the mercy of the parties' warring experts. The main objection to this procedure and the main reason for its infrequency are that the judge cannot be confident that the expert whom he has picked is a genuine neutral. The objection can be obviated by directing the party-designated experts to agree upon a neutral expert whom the judge will then appoint as the court's expert. The neutral expert will testify (as can, of course, the party-designated experts) and the judge and jury can repose a degree of confidence in his testimony that it could not repose in that of a party's witness. The judge and jurors may not understand the neutral expert perfectly but at least they will know that he has no axe to grind, and so, to a degree anyway, they will be able to take his testimony on faith.[35]

In closing, we reiterate that the obligation of the court remains to ensure that the expert, court-appointed or otherwise, provides the factfinder with maximally understandable evidence.

AUTHORS' NOTE

The authors thank Judge Jack Weinstein, Shari Diamond, and Rick Lempert for their helpful comments. The views expressed herein are those of the authors and do not necessarily represent the views of the Federal Judicial Center.

ENDNOTES

[1] *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

[2] Nancy Gertner and Joseph Sanders, "Alternatives to Traditional Adversary Methods of Presenting Scientific Expertise in the Legal System," *Dædalus* 147 (4) (Fall 2018).

[3] The notion of a scientist appointed to aid the court may be a departure from the common law tradition, but experts appointed by the courts are a common practice in Europe and other court systems that rely on a civil law tradition. See James G. Apple and Robert P. Deyling, *A Primer on the Civil Law System* (Washington, D.C.: Federal Judicial Center, 1995). In civil law courts, the judge plays a more active role in developing the evidence in a case and may direct the parties to provide the information deemed necessary to resolve the case. Under this civil law "inquisitorial" system, the court may appoint expert witnesses on its own initiative, and some courts maintain a list of such experts who can be called upon as needed to assist the court.

[4] Concern over the ability of courts to deal with complex scientific and technical evidence is long-standing. See, for example, Learned Hand, "Historical and Practical Considerations Regarding Expert Testimony," *Harvard Law Review* 15 (1) (1901): 40 – 58 [discussing the "anomaly" of asking a lay jury to resolve a dispute between expert witnesses], cited in Harold L. Korn, "Law, Fact & Science in the Courts," *Columbia Law Review* 66 (6) (1966): 1080 – 1116. Korn noted: "The unprecedented challenge of keeping the legal system attuned to the current pace of scientific advance suggests that [expert testimony] may now require a more broadly based kind of scrutiny than it has traditionally received." Ibid.

[5] Carol L. Krafka, Megan A. Dunn, Molly Treadway Johnson, et al., "Judge and Attorney Experiences, Practices, and Concerns Regarding Expert Testimony in Federal Civil Trials," *Psychology, Public Policy, and Law* 8 (3) (2002): 328.

[6] Ibid. The second most frequently cited problem is "[e]xcessive expense of party-hired experts."

[7] Arthur Kantrowitz, "Proposal for an Institution for Scientific Judgment," *Science* 156 (3776) (1967): 763 – 764. The history of various proposals for a science court are summarized in Andrew W. Jurs, "Science Court: Past Proposals, Current Considerations, and a Suggested Structure," *Virginia Journal of Law and Technology* 15 (2010): 1 – 42. See also Arthur Kantrowitz, "Controlling Technology Democratically," *American Scientist* 63 (5) (1975): 505 – 509; and Justin Sevier, "Redesigning the Science Court," *Maryland Law Review* 73 (3) (2014): 770 – 835.

[8] Task Force of the Presidential Advisory Group on Anticipated Advances in Science and Technology, "The Science Court Experiment: An Interim Report," *Science* 193 (1976): 653.

[9] For a discussion of an attempt to use the "science court" to resolve a dispute over placement of a high-voltage power line, see Jurs, "Science Court" [see note 7].

[10] When the judge is the trier of fact, he or she might also find it useful to have the experts serve an educational function by offering relevant substantive viewpoints prior to or at the beginning of the formal judicial proceedings. These proceedings could, in principle, include a role for a court-appointed expert.

[11] According to Rule 706(a): "The court may appoint any expert witnesses agreed upon by the parties, and may appoint expert witnesses of its own selection. . . . A witness so appointed shall be informed of the witness' duties by the court in writing, a copy of which shall be filed with the clerk, or at a conference in which the parties shall have opportunity to participate. A witness so appointed shall advise the parties of the witness' findings, if any; the witness' deposition may be taken by any party; and the witness may be called to testify by the court or any party. The witness shall be subject to cross-examination by each party, including a party calling the witness." Federal Rules of Evidence, Rule 706(a). For a more detailed discussion of Rule 706, see Jack B. Weinstein, Norman Abrams, Scott Brewer, and Daniel Medwed, *Evidence: Cases and Materials* (Eagan, Minn.: Foundation Press, 2017), chap. 7.

[12] Joe S. Cecil and Thomas E. Willging, *Court-Appointed Experts: Defining the Role of Experts Appointed under Federal Rule of Evidence 706* (Washington, D.C.: Federal Judicial Center, 1993). One no-

table instance of such an appointment involved the appointment of a multidisciplinary panel of experts to aid the court in resolving competing claims of harm caused by leakage from silicone gel breast implants. See Laural L. Hooper, Joe S. Cecil, and Thomas E. Willging, "Assessing Causation in Breast Implant Litigation: The Role of Science Panels," *Law and Contemporary Problems* 64 (4) (2001): 139 – 189. Approximately twenty-seven thousand cases alleging injuries from defective implants were consolidated in one federal jurisdiction. When it became clear that the key underlying dispute involved conflicting expert testimony regarding whether the leaking breast implants caused systemic connective tissue diseases such as lupus, the judge appointed a multidisciplinary panel of biomedical experts to review the scientific literature and prepare a written report that could be used in subsequent trials nationwide. While the expert panel report indicating no causal relationship appeared to be successful in moving the parties toward a resolution of this issue, the procedure also proved to be more costly than expected and the federal courts have not agreed to pay for another such expert panel. For the views of the scientists who served on the panel, see Barbara S. Hulka, Nancy L. Kerkvliet, and Peter Tugwell, "Experience of a Scientific Panel Formed to Advise the Federal Judiciary on Silicone Breast Implants," *New England Journal of Medicine* 342 (11) (2000): 812 – 815.

[13] Court-appointed experts in state court cases are quite rare. Judge John Wiley points out that while experts can be appointed by California judges under California Evidence Code Section 730, that option has rarely been used. See John Shepard Wiley, "Taming Patent: Six Steps for Surviving Scary Patent Cases," *UCLA Law Review* 50 (2003): 1413 – 1482.

[14] See, for example, J. J. Prescott and Kathryn Spier, "A Comprehensive Theory of Settlement," *NYU Law Review* 91 (1) (2016): 60 – 143.

[15] The Rule 706 advisory committee notes that "The ever-present possibility that the judge may appoint an expert in a given case must inevitably exert a sobering effect on the expert witness."

[16] We do note, however, that a small number of states have removed Rule 706 from their evidence code. See Edward J. Imwinkelried, "The Court Appointment of Expert Witnesses in the United States: A Failed Experiment," *International Journal of Medicine and Law* 8 (1989): 601 – 609. For a survey of state court practices, see Stephanie Domitrovich, Mara L. Merlino, and James T. Richardson, "State Trial Judge Use of Court Appointed Experts: Survey Results and Comparisons," *Jurimetrics Journal* 50 (3) (2010): 371 – 389.

[17] *Monolithic Power Systems v. O2 Micro International, Ltd.*, 726 F.3d 1359 (2013).

[18] *Monolithic Power Systems, Inc., et al. v. O2 Micro International, Ltd.*, 558 F.3d 1341 (Fed. Cir. 2009). "*See, e.g., Walker*, 180 F.3d at 1071 (finding no abuse of discretion in Rule 706 appointment where the scientific evidence was 'confusing and conflicting' and the appointment 'assist[ed] the court in evaluating contradictory evidence about an elusive disease of unknown cause')." Ibid.

[19] *Superior Beverage Company v. Owens-Illinois, Inc.*, No. 83 C 512, 1989 U.S Dist. LEXI 6662 (N.D. Ill. June 5, 1989). The role of coauthor Daniel Rubinfeld as the expert is described in Bret Dickey and Daniel Rubinfeld, "Antitrust Class Certification: Towards an Economic Framework," *NYU Law Annual Survey of American Law* 66 (3) (2011): 459 – 486.

[20] Federal Rule of Civil Procedure 23(a)(2). See also *Comcast Corp., et al. v. Behrend, et al.*, 133 S.Ct. 1426 (2013).

[21] Judge Rovner was later appointed to the Circuit Court.

[22] This is based on two informal conversations, one between Daniel Rubinfeld and the plaintiff's expert, business administration scholar Albert Madansky, and one between Rubinfeld and the defendant's expert, economist Franklin Fisher.

[23] *State v. Kraft General Foods, Inc.*, 926 F. Supp. 321 (S.D.N.Y. 1995).

[24] While courts have historically appointed medical experts to give technical advice, the more recent growth in the use of court-appointed experts has been in the intellectual property area. A recent example is Judge Richard Posner's appointment of antitrust expert Gregory Sidak as a neutral expert in the evaluation of intellectual property damages. For a detailed analysis of his role of court-appointed expert in *Brandeis University v. East Side Ovens, Inc.*, Nos. 1:12-cv-01508,

1:12-cv-01509, 1:12-cv-01510, 1:12-cv-01511, 1:12-cv-01512, 1:12-cv-01513 (N.D. Ill. 2013), see J. Gregory Sidak, "Court-Appointed Neutral Economic Experts," *Journal of Competition Law and Economics* 9 (2) (2013): 359 – 394.

[25] *Ex Parte Peterson*, 253 U.S. 300, 40 S.Ct. 543, 64 L.Ed. 919 (1920). "Courts have (at least in the absence of legislation to the contrary) inherent power to provide themselves with appropriate instruments required for the performance of their duties. This power includes authority to appoint persons unconnected with the court to aid judges in the performance of specific judicial duties, as they may arise in the progress of a cause."

[26] *Reilly v. United States*, 863 F.2d 149, 158 (1st Cir. 1988). See also "Improving Judicial Gatekeeping: Technical Advisors and Scientific Evidence," *Harvard Law Review* 110 (4) (1997).

[27] *Reilly v. United States*, 157 [see note 26].

[28] *Association of Mexican-American Educators v. State of California*, 231 F.3d 572 (2000).

[29] In dissent, Judge Tashima suggested a number of safeguards for ensuring that technical advisors provided assistance in a fair and neutral manner. Ibid., 611 – 614. More recently, Magistrate Judge James Orenstein (Eastern District of New York) appointed economics law scholar Alan Sykes to advise the court with respect to economic issues in connection with a proposed settlement in a large complex credit card case brought by Target and other retailers against Visa, Mastercard, and Discover. The retailers had some concerns relating to discovery, but the parties did not object to the appointment and the proposed settlement was approved by the court. The case is *In re Payment Card Interchange Fee and Merchant Discount Antitrust Litigation*, Case No. 1:05-md-01720 (E.D.N.Y. January 10, 2014).

[30] For an overview of the historical use of Rule 53, see Thomas E. Willging, Laural L. Hooper, Marie Leary, et al., *Special Masters' Incidence and Activity: Report to the Judicial Conference's Advisory Committee on Civil Rules and Its Subcommittee on Special Masters* (Washington, D.C.: Federal Judicial Center, 2000).

[31] *Medtronic Sofamor Danek, Inc., v. Michelson*, 229 F.R.D. 550 (2003). See also Shira A. Scheindlin and Jonathan M. Redgrave, "Special Masters and E-Discovery: The Intersection of Two Recent Revisions to the Federal Rules of Civil Procedure," *Cardozo Law Review* 30 (2) (2008): 372 – 374.

[32] Ibid., 559.

[33] *Medtronic Sofamor Danek, Inc. v. Michelson*, Nos. 01-2373, 03-2055, 2004 WL 2905399 (W.D. Tenn. May 3, 2004).

[34] Justice Breyer's view was promulgated in *General Electric Company v. Joiner*, 522 U.S. 136, 148 (1997). According to Justice Breyer, "[A] judge could better fulfill this gatekeeper function if he or she had help from scientists. Judges should be strongly encouraged to make greater use of their inherent authority . . . to appoint experts. . . . Reputable experts could be recommended to courts by established scientific organizations, such as the National Academy of Sciences or the American Association for the Advancement of Science."

[35] *In re High Fructose Corn Syrup Antitrust Litig.*, 295 F.3d 651, 665 (7th Cir. 2002). This reference and the Breyer reference are described in an insightful article in support of the use of court-appointed experts; see Judge Bradford H. Charles, "Rule 706: An Underutilized Tool to be Used when Partisan Experts Become 'Hired Guns,'" *Villanova Law Review* 60 (2015): 941 – 954. For evidence of additional judicial support, see Shira Scheindlin, "We Need Help: The Increasing Use of Special Masters in Federal Court," *DePaul Law Review* 58 (2009): 479 – 486.

IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

WAYMO LLC,

Plaintiff,

v.

UBER TECHNOLOGIES INC., OTTOMOTTO LLC, and OTTO TRUCKING LLC,

Defendants.
_____/

No. C 17-00939 WHA

REQUEST FOR LITERATURE

The judge requests each side to name one (and only one) book, treatise, article or other reference publicly available that will inform him about LiDAR, and particularly its application to self-driving vehicles.

Please keep in mind that the judge is already familiar with basic light and optics principles involving lens, such as focal lengths, the non-linear nature of focal points as a function of distance of an object from the lens, where objects get focused to on a screen behind the lens, and the use of a lens to project as well as to focus. So, most useful would be literature on adapting LiDAR to self-driving vehicles, including various strategies for positioning light-emitting diodes behind the lens for best overall effect, as well as use of a single lens to project outgoing light as well as to focus incoming reflections (other than, of course, the patents in suit). The judge wishes to learn the prior art and public domain art bearing on the patents in suit and trade secrets in suit.

The judge would like to read your submissions (again, only one reference per side) before the tutorial. Please just give the reference and our court library will check it out — unless the reference is difficult to locate, in which case please submit a hard copy. Please respond by **NOON A WEEK BEFORE THE TUTORIAL**. At the tutorial, however, you may use multiple references to back up your presentations and you should supply the judge with a booklet with the references copied (except for the one submitted in advance).

Thank you.

Dated: March 24, 2017.

WILLIAM ALSUP
UNITED STATES DISTRICT JUDGE