

SPECIALIZED TRIAL COURTS: CONCENTRATING EXPERTISE ON FACT

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ABSTRACT

In the absence of a specialized patent trial court with expertise in fact-finding, the Court of Appeals for the Federal Circuit often reviews *de novo* the many factual questions that pervade patent law. *De novo* review of fact by an appellate court is problematic. In the area of patent law, as in other areas of law, there are sound institutional justifications for the conventional division of labor that gives trial courts primary responsibility for questions of law. This Article identifies the problems created by *de novo* appellate review of fact and argues for the creation of a specialized trial court to which the Federal Circuit would feel compelled to defer on questions of fact. It also discusses how such a court would be designed, focusing on the manner in which trial court judges could use the court-appointed advisors to evaluate competing factual claims.

I. INTRODUCTION

For a number of years, commentators have advocated the creation of a specialized patent trial court. They have suggested that a specialized trial court could address issues of forum shopping and legal inconsistency at the trial court level, just as the 1982 creation of a specialized court of appeals—the Court of Appeals for the Federal Circuit (“CAFC” or “Federal Circuit”)—addressed these problems at the appellate level.¹ These commentators have also argued that a specialized court familiar with the intricacies of patent law and litigation would be much more efficient than the

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1. See, e.g., Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?*, 79 N.C. L. REV. 889, 932-33 (2000); John Pegram, *Should There Be A U.S. Trial Court With a Specialization in Patent Litigation?*, 82 J. PAT. & TRADEMARK OFF. SOC'Y 766, 790 (2000).

current trial courts, which typically undertake a patent trial only once every six to eight years.²

Though these points are important, this essay presents a more fundamental structural argument for a specialized trial court. This argument emerges from the reality that the complexity of patent law lies not in its legal principles but in the scientific fact-finding required to apply those legal principles properly. Indeed, difficult questions of scientific fact are likely to arise more routinely in patent law than in virtually any other field of law.³ Moreover, facts are often central to the ultimate disposition of patent cases. Not only is the question of infringement a complicated factual inquiry, but various other key inquiries, such as those into patent scope and patent validity, are also dominated by complex facts.

Commentators on specialized courts have noted that to the extent a legal field is complex not because of its law but because of its facts, such complexity militates in favor of deploying specialized expertise primarily at the level of the trial court.⁴ They have not, however, applied this important insight to the field of patents.⁵ Undertaking such an application is the goal of this essay. I begin by discussing the factual foundations of patent infringement, scope, and validity. I then turn to the repercussions of having these questions decided in the first instance by trial courts that have no particular scientific or technological expertise. One major repercussion of

2. Moore, *supra* note 1, at 933; Pegram, *supra* note 1, at 787-88.

3. For purposes of this essay, I assume that even though there is no bright-line theoretical division between law and fact, legal determinations, which generally apply across many cases, can fruitfully be distinguished from the factual questions specific to a particular case. This manner of distinguishing law from fact has implications for how thoroughly facts need to be reviewed in the judicial system. *See infra* Part II.B. The law/fact distinction can be seen most clearly if one also acknowledges that there is a third category of decisionmaking that involves the application of law to fact. Indeed, many questions of patent law, including the questions of claim construction and validity on which this article focuses, require this third category of decisionmaking, and thus are best seen as mixed questions of law and fact. For an extended discussion of the law/fact distinction in patent cases, see Arti Rai, *Facts, Law, and Policy: An Allocation-of-Powers Approach to Patent Reform* (Working Paper, 2002) (on file with author).

4. *See* Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U. L. REV. 1, 74 (1989) (noting that “[w]hen the law is clear but difficult to apply to complex factual situations,” expertise is most usefully deployed not at the appellate level but at the administrative or trial level); *see also* Richard Revesz, *Specialized Courts and the Administrative Lawmaking System*, 138 U. PA. L. REV. 1111, 1168-69 (1990) (noting that concerns about the complexity of facts are not reasons for creating a specialized *appellate* court) (emphasis added).

5. Even though Rochelle Dreyfuss’ important article addresses patent law, it focuses on the role of the Federal Circuit in clarifying and making uniform the previously inconsistent body of patent law. *See generally* Dreyfuss, *supra* note 4.

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the current system is that the Federal Circuit has taken it upon itself to decide many questions of fact *de novo*. In some cases it has done so directly, by declaring that there can be no dispute as to a particular factual question.⁶ In other cases, it has done so indirectly, by denominating questions that have factual foundations—for example, mixed questions of law and fact such as claim construction—as pure questions of law. Given the trial courts' lack of familiarity with patent cases, the Federal Circuit's suspicion of trial court decision-making, even on factual issues, is understandable. By the same token the Federal Circuit is not necessarily better equipped than the trial court to make factual determinations in any particular area of science and technology. Only four of the eleven active judges on the Federal Circuit are technically trained.⁷ More importantly, as discussed below, even if all Federal Circuit judges were technically trained, they could hardly be expected to be knowledgeable in the dozens of scientific and technical fields in which patent litigation can arise.⁸ In addition, it is hardly efficient to have an appellate court decide case-specific factual questions *de novo*, after a lower court has already expended time and resources on the same questions. Consequently, in the area of patent law, as in other areas of law, there are sound institutional reasons for the conventional division of labor that gives trial courts primary responsibility for questions of fact and appellate courts primary responsibility for questions of law.

Establishing a specialized trial court with primary responsibility for factual decisions, however, poses challenging questions of institutional design. For example, in addressing the general issue of scientific fact-finding in the court system, some commentators have argued that only judges and jurors who actually have training in a particular scientific or technical area should be considered epistemically qualified to make factual findings in that area.⁹ Although these commentators make a forceful point regarding judicial competence, proposals for “two-hat” judges and juries would essentially involve creating a patent trial court that replicated the highly specialized structure of an administrative agency like the Patent and Trademark Office. From a cost-benefit standpoint, this move would be

6. *See infra* Part II.B.

7. Judges Gajarsa, Linn, Lourie, and Newman have technical backgrounds. *See* United States Court of Appeals for the Federal Circuit, Judicial Biographies, at <http://www.fedcir.gov/judgbios.html> (last visited Mar. 21, 2002).

8. Patents, and patent litigation, span the gamut of the physical and natural sciences, engineering, computer science, and various social sciences.

9. *See, e.g.*, Scott Brewer, *Scientific Expert Testimony and Intellectual Due Process*, 107 YALE L.J. 1535 (1998).

impractical. The alternative of a specialized trial court that relied heavily on court-appointed experts would likely be sufficient for making educated factual findings. This level of understanding might be particularly easy to achieve if the role of the jury were cabined substantially.¹⁰

It might be argued that, at least to some extent, market forces are already leading us to the type of specialization that I propose: judges on certain courts, such as the district court of Delaware and the Northern District of California, handle patent cases quite frequently; in general, the ten district courts that have the highest number of patent cases hear about forty percent of all such cases.¹¹ Moreover, given that we already have a specialized appellate court for patents, creating a trial court that focused specifically on patents might unduly sacrifice breadth of vision on the altar of expertise.

These criticisms have considerable merit. Nonetheless, they do not undermine the case for a specialized trial court. As matters currently stand, more than half of all cases are handled by courts with very little experience in the type of complicated fact-finding required by patent law. In addition, the Federal Circuit does not appear to give our semi-specialized district courts significantly greater deference than other district courts. A single patent trial court that had explicitly been given the imprimatur of authority over fact-finding would, in all likelihood, compel greater deference than the current trial courts. Furthermore, although a single patent trial court might be subject to the problems of capture and tunnel vision that potentially plague all specialized courts, these problems should have less force at the trial level than at the appellate level.

This Article proceeds in three parts. Part II discusses the factual foundations of such key determinations as patent infringement, validity, and scope, as well as the manner in which the Federal Circuit has taken to reviewing these factual foundations *de novo*. It also argues that *de novo* fact-finding by the Federal Circuit should be avoided, for it promotes inefficiency as well as substantively bad results. Parts III and IV then address some of the difficult questions of institutional design raised by the prospect of a specialized trial court. Part III makes the argument for a court composed of individuals who would have some exposure to scientific methodology but who would rely heavily on court-appointed experts. Part IV discusses the reasons why a single specialized trial court

10. The data suggest that because lay juries appear to be significantly less skilled than lay judges in making the complex factual determinations central to patent law, their role should be substantially reduced, perhaps by invoking some version of a “complexity” exception to the Seventh Amendment. *See infra* Part III.C.

11. *See Moore, supra* note 1, at 571.

IV discusses the reasons why a single specialized trial court would be superior to our current system of semi-specialization.

II. THE FEDERAL CIRCUIT'S FACT-FINDING

A. The Role of Facts in Patent Law

Facts are critical in patent law. Even the Federal Circuit has acknowledged, for example, that patent infringement is a question of fact.¹² Facts are also central to two other important inquiries in patent law: the determinations of patent scope and patent validity.

The scope of a patent—that is, how much territory the patent covers—is determined through the practice of claim construction.¹³ Claim construction begins with the “plain language” of the claim. Notably, however, under both Federal Circuit case law and the most plausible reading of various sections of the patent statute, this plain language should be interpreted *not* from the perspective of the ordinary speaker of English but, rather, from the vantage point of a “person having ordinary skill in the art” (“PHOSITA”).¹⁴ The typical judge is unlikely to be a person skilled in the relevant art. Accordingly, after examining the plain language of the claim terms using established canons of claim construction,¹⁵ she may well find

12. *See, e.g., Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1348-49 (Fed. Cir. 2000).

13. *See Markman v. Westview Instruments Inc.*, 517 U.S. 370, 373-74 (1996).

14. *See, e.g., Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998) (“It is the person of ordinary skill in the field of the invention through whose eyes the claims are construed.”); *Markman v. Westview Instruments*, 52 F.3d 967, 986 (Fed. Cir. 1995) (holding that construction of claim term turns on “what one of ordinary skill in the art at the time of the invention would have understood the term to mean”). Similarly, sections 103 and 112 of the patent statute, which respectively cover the patent validity requirements of nonobviousness and adequate disclosure, turn on the vantage point of one of ordinary skill in the art. 35 U.S.C. §§ 103, 112 (1994). In contrast, according to textualist theories of statutory interpretation, statutory language is interpreted from the standpoint of the ordinary speaker of English. *See, e.g., Green v. Bock Laundry Mach. Co.*, 490 U.S. 504, 528 (1989) (Scalia, J., concurring) (prescribing the interpretation of statutory terms based on “which meaning is . . . most in accord with context and ordinary usage . . .”). Because of this contrast between claim construction and statutory interpretation, even those committed to strict textualism in the context of statutory interpretation should not embrace such textualism in the context of claim construction.

15. The most prominent of these canons involve the relationship between the patent claims and the patent specification (i.e., the body of the patent in which the invention is described). Under black letter patent law, one may use the specification to help define a term or limitation already in a claim. However, one may not read a limitation from the specification into a claim. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582

the language opaque. In fact, to the extent the judge does not find the language opaque, it may be that she is making unwarranted assumptions about how one skilled in the art would interpret the language.

In most cases involving technically complex invention, the judge would be well-advised to turn to the testimony of experts in the relevant scientific or technological community (so-called “extrinsic evidence”). Indeed, in its 1996 *Markman v. Westview Instruments*¹⁶ decision, the Supreme Court explicitly recognized that discerning the meaning of a claim term within a trade or profession could be an “evidentiary” investigation.¹⁷ Based on this recognition, the *Markman* court concluded that claim construction is a “mongrel practice” that “falls somewhere between a pristine legal standard and a simple historical fact.”¹⁸

Just as claim construction is a fact-dependent inquiry, so too is patent validity. The central determinants of patent validity are the inquiries regarding nonobviousness and adequate disclosure. Both questions combine determinations of law and fact. To satisfy the nonobviousness criterion, the patentee must show that, at the time of its invention, the subject matter of her patent application would not have been obvious to the PHOSITA.¹⁹

(Fed. Cir. 1996). The specification may prove particularly useful for claim construction when the patentee uses it specifically to define a claim term. *See Johnson Worldwide Associates, Inc. v. Zebco Corp.*, 175 F.3d 985, 990 (Fed. Cir. 1999) (noting that a patentee may choose to be her own lexicographer by explicitly setting forth a definition for a claim term).

16. 517 U.S. 370 (1996).

17. *Id.* at 390-91. In some respects, claim construction is analogous to the interpretation of contractual terms. Courts often look at factual evidence regarding how a particular contract term is used in a given trade or industry when determining its meaning.

18. *Id.* at 378, 388 (quoting *Miller v. Fenton*, 474 U.S. 104, 114 (1985)). To be sure, the Supreme Court decision in *Markman* did choose to assign the task of claim construction to the judge rather than to the jury. It did so, however, on the basis of largely functional considerations, deciding that such interpretation could best be done by a judge. *Id.* at 378 (“Where history and precedent provide no clear answers, functional considerations also play their part in the choice between judge and jury to define terms of art.”).

19. *See* 35 U.S.C. § 103 (1994). Empirical work by Mark Lemley and John Allison indicates that nonobviousness is the most important criterion in determining patent validity; forty-two percent of patents that are held invalid in litigation are invalidated on grounds of nonobviousness. John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q. J. 185, 208 (1998). Another important (and somewhat related) ground for finding patents invalid is lack of novelty under section 102. *Id.* (noting that 26.8% of patents are invalidated on grounds of lack of novelty). In these cases, the invention is not merely obvious given the prior art, but is actually already found in the prior art. As with nonobviousness, facts are central to the novelty determination. Even the Federal Circuit has recognized this reality. *See Rappaport v. Dement*, 254

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As the Supreme Court has emphasized, the nonobviousness inquiry is necessarily based on factual questions regarding the scope and content of the prior invention (known as “prior art”) in the field; differences between the prior art and the claims at issue; and the level of the ordinary skill in the relevant art.²⁰ The secondary considerations that help to prove nonobviousness, such as the commercial success of an invention or a “long-felt need” for the invention, are also factual determinations.²¹

Like the nonobviousness inquiry, the inquiry into adequate disclosure is grounded in fact. The most important component of adequate disclosure, the enablement requirement, requires the patentee to disclose information sufficient to allow a person of ordinary skill in the art to make and use the patented invention without “undue experimentation.”²² The test for enablement therefore requires the judge to make factual findings regarding the level of skill in the art.²³

B. The Federal Circuit’s Alchemy: Turning Facts into Law

Ignoring conventional allocation-of-power principles that give trial courts primary authority over factual questions, the Federal Circuit has asserted power over fact. In the context of claim construction, it has done so by simply declaring claim construction to be a pure question of law subject to de novo review. The CAFC announced de novo review of claim construction in 1995, in its en banc *Markman v. Westview Instruments*²⁴ opinion. When the Supreme Court granted *certiorari* in the *Markman* case, however, it did not endorse de novo review. To the contrary, the Court’s observation that claim construction combined both law and fact appeared to suggest a more deferential standard of review. In the face of the ambiguity caused by the Supreme Court decision, the Federal Circuit explicitly

F.3d 1053, 1057 (Fed. Cir. 2001) (noting that anticipation, one mechanism for proving lack of novelty, is a question of fact).

20. *Graham v. John Deere*, 383 U.S. 1, 17 (1966).

21. *See, e.g., Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 991 (Fed. Cir. 1988).

22. *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir.1993); *In re Vaeck*, 947 F.2d 488, 495-96 (Fed. Cir. 1991). Other less significant components of adequate disclosure include the written description requirement and the best mode requirement. Notably, assessing compliance with these requirements is considered a determination of fact. *See, e.g., Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991) (written description); *De-George v. Bernier*, 768 F.2d 1318, 1324-25 (Fed. Cir. 1985) (best mode).

23. *See PPG Indus., Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1564 (Fed. Cir. 1996) (observing that enablement is a question of law based on underlying factual findings).

24. 52 F.3d 967 (Fed. Cir. 1995) (en banc).

affirmed its commitment to de novo review two years later, in another en banc decision, *Cybor Corp. v. FAS Technologies*.²⁵

The court has been quite aggressive in its application of de novo review. Two recent empirical studies estimate that the Federal Circuit has disagreed with lower court claim construction in at least one-third of all appealed cases.²⁶ Notably, the Federal Circuit's plenary review of claim construction can have something of a domino effect, leading the court to arrogate power over issues even it admits are factual, such as infringement.

This domino effect works as follows: because claim construction bears heavily on the question of infringement, a decision to overturn the district court's claim construction often means that a new determination regarding infringement must be made. At that point, the Federal Circuit faces two choices. It can either remand to the district court for cumbersome new fact-finding on the question of infringement, or it can simply determine the question of infringement itself. Even though infringement is, under the Federal Circuit's own jurisprudence, a factual issue,²⁷ the Federal Circuit is often reluctant to remand for a new trial on infringement. Rather, the court simply declares that there is no factual dispute with respect to infringement. As a consequence, de novo review of claim construction effectively becomes de novo review of infringement.

25. 138 F.3d 1448 (1998).

26. See Christian Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075, 1104 (2001) (giving figure of 44%); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. TECH. 1, 11 (2001) (giving figure of 33%). The discrepancy between the Moore and Chu findings likely emerges from two factors. First, while Moore's study encompasses cases decided between April 1996 and December 2000, Chu's study encompasses cases decided between January 1998 and April 2000. In addition, while Moore's includes within her population of cases Rule 36 summary affirmances, Chu excludes these affirmances. Chu's study also draws interesting conclusions regarding the Federal Circuit's review of patent cases more generally. He determines that, excluding summary affirmances, the overall reversal rate was 47.3%. *Id.* at 1098. Including summary affirmances, the overall reversal rate was 36.6%. *Id.* at 1100.

27. See *supra* note 12. Both infringement and infringement under the doctrine of equivalents are factual issues. See *Hilton Davis Chemical Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1520-21 (Fed. Cir. 1995) (en banc) (citing *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609-10 (1950), for the proposition that a finding of equivalence is a question of fact). The equivalence inquiry requires the fact-finder to determine whether the allegedly infringing invention performs the same function in the same way to achieve the same result as the patented invention. This so-called function-way-result equivalence can result in a finding of infringement even when the accused invention does not literally infringe the claims of the relevant patent. See generally *Graver Tank*, 339 U.S. 605.

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For example, in *Pall Corporation v. Hemasure, Inc.*,²⁸ the patentee claimed that the defendant had infringed its patent on a system that filtered leukocytes (white blood cells) from blood. The district court broadly construed the disputed claim language, which referred to a “gas outlet comprising a porous medium.” Based on that broad construction, the trial court found literal infringement.²⁹ On appeal, the Federal Circuit substituted a narrower interpretation, stating that given the description in the specification, the porous medium actually had to be placed at the outlet of the system.³⁰ Relying on this narrower construction, the Federal Circuit held that there could be no dispute that the defendant’s device escaped infringement, not only literally but also under the doctrine of equivalents.³¹ The court entered a judgment for the defendant.³²

In contrast to its stance on claim construction, the Federal Circuit has not declared validity determinations like nonobviousness and enablement to be pure questions of law. Rather, the court has focused exclusively on the legal component of nonobviousness and has argued that de novo review should apply to all components of the nonobviousness determination, whether made by a trial judge or a jury. Soon after the Federal Circuit’s creation, its propensity for de novo review became evident. In *Dennison Manufacturing Co. v. Panduit Corp.*,³³ the Supreme Court responded to an appellant’s complaint that the Federal Circuit was exercising plenary power over the nonobviousness determination by asking the CAFC to explain the standard of review it applied to trial court findings regarding nonobviousness. On remand, the Federal Circuit dutifully discussed at some length the factual foundations of nonobviousness.³⁴ Despite this acknowledgement, various judges on the Federal Circuit have continued to assert plenary power over nonobviousness. For example, in *Newell Companies, Inc. v. Kenney Mfg. Co.*,³⁵ a case decided only a year after the remand in *Dennison*, the majority simply announced that there was no fac-

28. 181 F.3d 1305, 1307 (1999).

29. *Id.* at 1310.

30. *Id.*

31. For a discussion of the doctrine of equivalents, see *supra* note 27.

32. In a recent article, William Rooklidge and Matthew Weil point to *Pall Corporation* and similar cases in which the Federal Circuit has reviewed infringement determinations de novo. See William C. Rooklidge and Matthew Weil, *Judicial Hyperactivity: The Federal Circuit’s Discomfort With Its Appellate Role*, 15 BERKELEY TECH. L.J. 725 (2000). They do not, however, note the connection between the court’s de novo claim construction and its de novo review of infringement.

33. 475 U.S. 809 (1985).

34. 810 F.2d 1561, 1566 (1987).

35. 864 F.2d 757, 762-65 (Fed. Cir. 1988).

tual dispute with respect to nonobviousness and that it could therefore review the jury's determination of nonobviousness de novo. The majority declared that there was no issue of fact even though one of the patentee's main arguments, which the court rejected, was a factual assertion regarding the differences between a particular prior art patent and his own patent.³⁶

Similarly, in important cases involving the enablement requirement, the court has paid mere lip service to principles of deferential review. In *Northern Telecom, Inc. v. Datapoint Corporation*,³⁷ a case involving claims to a method for entering, verifying, and storing data using a batch data entry terminal, the CAFC faced a decision by the lower court finding that the method claims in question were not enabled. The district court had concluded that, because the patentee had not provided any details regarding the data entry program in question, undue experimentation would be required to write the program.³⁸ The Federal Circuit noted that the amount of disclosure required to enable a software-based invention generally varies depending on the facts of the particular case. These facts might include "the nature of the invention, the role of the program in carrying it out, and the complexity of the contemplated programming, all from the viewpoint of the skilled programmer."³⁹ The CAFC also acknowledged that a number of expert witnesses had testified that further detail regarding the program would indeed have been useful "in order to avoid spending experimental time."⁴⁰ The Federal Circuit even noted that the district court's determination regarding undue experimentation should be overturned only for clear error.⁴¹ Nonetheless, the appellate court reversed the trial court's enablement finding. The *Northern Telecom* decision is particularly pernicious because the Federal Circuit now appears to have elevated to the level of law the idea that very little disclosure is necessary to enable computer software, irrespective of the nature and complexity of the software involved.⁴²

36. *Id.* at 768 (rejecting patentee's argument that the prior art taught away from a do-it-yourself adjustable shade). Dissenting in that case, Judge Newman attacked the panel majority for baldly asserting that the facts were undisputed on appeal. *Id.* at 773 (Newman, J., dissenting).

37. 908 F.2d 931, 933 (Fed. Cir. 1990).

38. *Id.* at 943.

39. *Id.* at 941.

40. *Id.* at 942 (noting testimony of expert witness).

41. *Id.* at 943.

42. See Dan L. Burk & Mark A. Lemley, *Biotechnology's Uncertainty Principle* (Working Paper) (on file with author) (noting that "the Federal Circuit has articulated very loose, almost trivial standards for disclosure of computer software").

C. Why De Novo Review of Fact is a Bad Idea

The Federal Rules of Civil Procedure give trial courts primary responsibility for fact finding.⁴³ The central normative justification for this assignment of responsibility turns on the need to conserve scarce judicial resources.⁴⁴ If the appellate court attempted to acquire the district court's knowledge of any given factual setting (whether through careful review of the documentary record or by calling witnesses itself), that acquisition would come at great expense.⁴⁵ Relative to that expense, the benefits of having another fact-finder are, in the vast majority of cases, likely to be small.⁴⁶ Moreover, unlike de novo review of legal principles, de novo review of facts is typically not essential for the appellate court to perform its primary task—maintaining the uniformity of the law as a whole. This is particularly true in patent cases, where the facts in question are typically “adjudicative,” or case-specific, facts. Factual disputes in patent cases generally turn on how a particular patented invention relates either to an allegedly infringing invention or to the state of technical knowledge in a field at a given time.⁴⁷ Because it is unlikely that such facts will be relevant in future cases, exacting review of these facts, even in cases where they largely determine the answer to a legal question, is not necessary for maintaining legal uniformity.⁴⁸ Indeed, to the extent that the Federal Cir-

43. FED. R. CIV. P. 52(a).

44. In cases where the jury acts as the fact-finder, it could also be argued that respect for the jury's fact-finding role under the Seventh Amendment requires appellate deference.

45. *Pierce v. Underwood*, 487 U.S. 552, 560 (1988).

46. *Anderson v. City of Bessemer*, 470 U.S. 564, 574-75 (1985) (“Duplication of the trial judge's efforts in the court of appeals would very likely contribute only negligibly to the accuracy of fact determination at a huge cost in diversion of judicial resources.”). De novo review may be justified when the facts in question are not specific to the particular case but are likely to be relevant to many different cases. *See* note 48 *infra*.

47. The relevant point in time may be the time the invention was made or the time that the patent application was filed.

48. Adjudicative facts may usefully be contrasted with “legislative” facts—that is, general facts about the world that may be relevant in a wide variety of cases. Because of their widespread application, legislative facts may be reviewed under a de novo standard. Although some scientific principles are analogous to legislative facts in that they transcend a particular dispute, the facts most relevant to patent cases are almost never transcendent scientific principles. *See* David Faigman et al., *Check Your Crystal Ball at the Courthouse Door, Please: Exploring the Past, Understanding the Present, and Worrying About the Future of Scientific Evidence*, 15 CARDOZO L. REV. 1799, 1821 (1994) (arguing that scientific information that transcends a particular dispute is like a legislative fact and should be reviewed de novo). Rather than turning on timeless scientific principles, patent cases usually turn on far more mundane inquiries regarding how a given invention

cuit gives particular facts—for example, the level of the ordinary skill in art at a particular point in time—precedential, or “law-like” value, it commits the serious error of assuming skill in the art is static.

It may be argued that because the CAFC is a specialized court, with expertise superior to that of the trial courts, the cost-benefit analysis that underlies the traditional allocation of power between trial and appellate court should not apply. However, the expertise enjoyed by the Federal Circuit rests in the area of patent *law*, not in the factual particulars of any given technology. Only four of the eleven active judges on the Federal Circuit have technical training.⁴⁹ More importantly, even those who are technically trained are unlikely to have expertise in the area of science or technology raised by any given patent case. Indeed, as discussed further in Part II *infra*, it is difficult to imagine the creation of a court that would have even one judge, let alone a group of judges, trained in all of the various different areas of science and technology to which the patent system applies. Accordingly, it should not be surprising that a number of Federal Circuit cases provide grounds for questioning the court’s *de novo* review of trial court fact-finding. For example, in cases involving computer software,⁵⁰ the CAFC’s tendency to believe that any and all software programs can be enabled without disclosure of source code, flow charts, or other detail has led it to overturn enablement findings by lower courts that paid more careful attention to expert testimony addressing the particulars of the case.

To be sure, there is also reason to question whether the lay judges and jurors who serve on generalist trial courts do a thorough job of fact-finding in technically challenging cases. Indeed, a significant analytical and empirical literature—discussed further in Part III *infra*—suggests that lay persons, faced with competing expert accounts of a scientific or techno-

relates to other inventions or to the state of technical knowledge in a particular field at a given point in time.

The major context in which facts found in a particular patent case might have relevance for future cases, such that deferential review might lead to lack of uniformity, would be where the same patent was asserted against different parties in different cases. In such a situation, two different trial courts might, based on different factual findings, reach different conclusions on validity or claim construction. If the appellate court were to defer to the factual findings of the trial court in each case, it might not be able to reconcile the trial court holdings. These situations should arise relatively rarely, however. Moreover, at least in cases where the earlier trial court holding found against the patentee on the relevant issue or issues, defensive issue preclusion would control the issue in the later case.

49. See *supra* note 7.

50. See *supra* notes 37-41.

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logical dispute, are unlikely to make considered judgments. The solution, however, is not to set up the CAFC as a trial court. Rather, it is to bolster the expertise of the trial courts in deciding questions of fact.

III. INSTITUTIONAL CHALLENGES IN SETTING UP A SPECIALIZED TRIAL COURT

So how should we set up a specialized patent trial court? We can receive some guidance from the substantial literature outside the patent field on how trial courts should address cases involving scientifically challenging facts. This literature has grown in volume since the 1993 Supreme Court opinion in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,⁵¹ which interpreted key provisions of the Federal Rules of Evidence concerning the admissibility of scientific expert testimony. In *Daubert*, the Supreme Court responded to fears about “junk science” undermining the accuracy and fairness of judicial decisionmaking by mandating that judges take a much more aggressive role in evaluating expert scientific and technical testimony.

Under *Daubert*, judges should admit proffered scientific evidence for evaluation by the fact-finder (whether the jury or the judge herself) only when the evidence is scientifically valid—that is, “ground[ed] in the methods and procedures of science”⁵² and “derived by the scientific method.”⁵³ The *Daubert* analysis offers four questions that a trial court should consider in determining scientific validity: 1) is the expert’s method or technique testable or falsifiable; 2) has the method been subjected to peer review and publication; 3) does the method have a high known or potential error rate; and 4) is the method generally accepted in the scientific community.⁵⁴ Although these factors provide a framework

51. 504 U.S. 579 (1993).

52. *Id.* at 590.

53. *Id.* The *Daubert* Court’s discussion of scientific knowledge relied on Webster’s dictionary and two *amicus* briefs, one by a group of scientists, the other by the American Association for the Advancement of Science and the National Academy of Sciences. The Court observed that science “represents a process for proposing and refining theoretical explanations about the world that are subject to further testing and refinement.” *Id.*

54. *Id.* at 593-94. Federal Rule of Evidence 702 has recently been amended in a manner that largely conforms to the prescriptions of the *Daubert* test. Rule 702 states:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient reliable facts or data (2) the testimony is the product of reliable principles and methods and (3) the

by which an admissibility determination may be made, none is either necessary or sufficient. By contrast, under the prior rule, enunciated in the 1923 case *Frye v. United States*,⁵⁵ the judge's role had been much more passive: the necessary and sufficient criterion for admissibility of scientific testimony had simply been "general acceptance in the particular field to which it belongs."⁵⁶

The Supreme Court has also made it clear that it considers the scope of *Daubert* to be quite wide. Specifically, in the 1999 case *Kumho Tire Co. v. Carmichael*,⁵⁷ the Court held that the *Daubert* factors apply not simply to the type of scientific testimony traditionally offered in courtrooms (for example, testimony on forensic science or epidemiology) but also to all expert testimony based on specialized knowledge. As a consequence, trial courts have begun to entertain *Daubert* challenges in patent cases. For example, when experts offer testimony on such factual issues as infringement or the factual foundations of nonobviousness and claim construction, their testimony can be subject to a *Daubert* challenge.⁵⁸

The exacting requirements that *Daubert* and its progeny impose on lay judges have been the subject of considerable controversy. Judge Kozinski of the Ninth Circuit, who authored the opinion upon remand from the Supreme Court in *Daubert*, pointedly noted that "[a]s we read the Supreme Court's teaching in *Daubert*, therefore, though we are largely untrained in science and certainly no match for any of the witnesses whose testimony we are reviewing, it is our responsibility to determine whether those experts' proposed testimony amounts to 'scientific knowledge,' constitutes 'good science,' and was 'derived by the scientific method.'"⁵⁹ More generally, scholars have questioned the extent to which judges can understand and properly apply the *Daubert* criteria. Scholars have pointed out, for example, that *Daubert* provides almost no guidance on how the decision-making guideline of falsifiability should be applied or on how the error

witness has applied the principles and methods reliably to the facts of the case.

FED. R. EVID. 702.

55. 293 F. 1013 (D.C. Cir. 1923).

56. *Id.* at 1014.

57. 526 U.S. 137, 141 (1999).

58. *See, e.g.,* Carnegie Mellon Univ. v. Hoffman-LaRoche, Inc., 55 F. Supp. 2d 1024 (N.D. Cal. 1999) (excluding expert testimony on infringement based on a *Daubert* challenge).

59. *Daubert v. Merrell Dow Pharms. Inc.*, 43 F.3d 1311, 1316 (9th Cir. 1995).

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rate of a particular scientific technique should be determined.⁶⁰ In addition, recent empirical evidence suggests that the majority of judges (at least state court trial judges) have difficulty understanding such basic *Daubert* concepts as falsifiability and error rate.⁶¹

If cases are to be decided correctly, however, the challenges posed to trial courts by scientific and technical evidence extend far beyond threshold admissibility questions. Indeed, these challenges must be addressed squarely no matter what the threshold test for admissibility. Even if technical evidence is sufficiently reliable so as to be admissible, it may nonetheless be inferior to other, conflicting evidence. A lay judge or juror is likely to have difficulty adjudicating between competing factual claims of opposing experts, particularly when each expert, *ex hypothesi*, employs a methodology sufficient to surmount the *Daubert* bar.⁶² When lay individuals are dealing with technically challenging questions, the usual mechanisms by which they decide whether or not to give weight to particular testimony—for example, its internal consistency or the demeanor of the witness who is giving the testimony—simply do not carry much weight.⁶³ Even according deference based on the relative credentials of the compet-

60. See, e.g., Sophia Gatowski et al., *Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a Post-Daubert World*, 25 LAW & HUM. BEHAV. 433, 437 (2001).

61. The Gatowski survey of state trial judges indicates that, although judges generally support the gatekeeping role defined by *Daubert*, they do not appear to understand the test particularly well. Only five percent of the respondents demonstrated a clear understanding of the falsifiability concept and only four percent demonstrated a clear understanding of the error rate concept. *Id.* at 433.

62. Scott Brewer notes the strange result that emerges from use of the *Daubert* bar:

When the evidence is so weak that no reputable scientist in the field would endorse it, prevent the nonexpert from hearing it (and from hearing that no reputable expert would endorse it); but when the best scientific theories and methods underdetermine the result, let the nonexpert decide who is correct.

Brewer, *supra* note 9, at 1600.

63. See *id.* at 1619-25. As David Faigman explains in regard to the usefulness of demeanor:

Good scientific research simply does not depend on the credibility of individual witnesses. If the question is whether the declarant made a statement under a belief of impending death, the nurse's credibility might be critical. . . . In contrast, whether a series of six epidemiological studies supports the conclusion that the relative risk associated with silicone implants exceeds 2.0 for connective tissue disorder does not entail the same sort of credibility assessment.

David L. Faigman, *Appellate Review of Scientific Evidence Under Daubert and Joiner*, 48 HASTINGS L.J. 969, 978-79 (1997).

ing witnesses assumes that the layperson is competent to judge which credentials are most relevant as a basis for weighing the persuasiveness of testimony in a given field.⁶⁴ More importantly, credentials do not substitute for the type of substantive evaluation that should be required in any judicial process that adheres to a minimal standard of fairness and accuracy.

In order to assist lay judges and juries in deciding cases involving complicated factual issues, scholars of the court system have suggested that the trial court can avail itself of a wide range of expert help. For example, Justice Breyer's concurring opinion in the 1997 case *General Electric Company v. Joiner*⁶⁵ notes that special masters and specially trained law clerks can assist the court in technically complicated cases.⁶⁶ Judges can also use their inherent power to appoint technical advisors who can serve as specialized law clerks. Finally, judges can invoke Rule 706 of the Federal Rules of Evidence and appoint their own expert witnesses.

One might challenge liberal use of third-party expertise on the grounds that such assistance gives the adversarial judicial process an inquisitorial cast. In technically complex cases involving conflicting expert testimony, however, reducing the adversarial component may be a virtue rather than a vice. "Battles of the experts" in which the parties present well-credentialed individuals making opposing claims are likely to shed more heat than light. In addition, careful limitations on the roles played by third-party experts can prevent cases from being removed from the control of the parties. Consider, for example, the situation in which the court appoints an expert to act as a technical advisor. Because technical advisors work outside the scrutiny of the parties, and may not be deposed or called to testify, trial courts have tended to limit the advisor's role to providing the court with a general tutorial on the relevant science and technology. Courts have avoided using technical advisors for direct opinions on the merits of the parties' testimony.⁶⁷

In contrast, the Rule 706 expert witness may be deposed, called to testify, and cross-examined by the parties.⁶⁸ The expert witness must also make her findings available to the parties. Similarly, the court must make its own instructions to the expert witness available to the parties. As a con-

64. Brewer, *supra* note 9, at 1624-34.

65. 522 U.S. 136 (1997).

66. *Id.* at 149-50.

67. *See, e.g., MediaCom Corp. v. Rates Tech., Inc.*, 4 F. Supp. 2d 17, 30 n.11 (D. Mass. 1998) (noting that technical advisor appointed in case would play an educational role and would not be used for fact-finding).

68. FED. R. EVID. 706(a).

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sequence of this greater transparency, it becomes appropriate for expert witnesses to offer opinions on the parties' testimony. Indeed, according to Federal Judicial Center survey data, courts have appointed expert witnesses to assist in resolving conflicting expert testimony.⁶⁹

A contentious issue raised by the use of third-party expertise, particularly the use of Rule 706 experts, involves who should participate in the appointment process. Allowing the parties to the case to be involved may increase the expert's legitimacy. By the same token, each of the parties will no doubt lobby for the individual who is most allied with their interests. The choice of the expert is particularly important in cases where the scientific or technical dispute is prominent and heated. In areas of heated scientific controversy, all individuals who are sufficiently knowledgeable to qualify as experts may have already committed themselves to one or the other side of a dispute.

More generally, even in cases where the relevant scientific disputes are not as heated, judges must make difficult choices about which experts to appoint. An intelligent choice of expert requires, however, that the judge has some ability to evaluate the expert's work. To the extent that evaluating the expert's work requires an understanding of the relevant science and technology in the first instance, suggestions that trial courts rely on court-appointed experts may beg the question rather than address it.

In lieu of using court-appointed experts, Scott Brewer suggests that we have scientifically or technically trained judges and juries in cases where scientific or technical facts are at issue.⁷⁰ Brewer's proposal for a "two-hat" solution is important and provocative. By showing us what strict adherence to an ideal of judicial competence in technically complicated cases might require, Brewer demonstrates how far we have to travel. A host of practical difficulties attends his proposed solution, however. First, because expertise in one area of science or technology does not transfer over to other areas,⁷¹ Brewer's proposal would require selecting a group of

69. Si-Hung Choy, Comment, *Judicial Education After Markman v. Westview Instruments, Inc.: The Use of Court-Appointed Experts*, 47 UCLA L. Rev. 1423, 1428 (2000) (citing results from Federal Judicial Center survey). Court-appointed expert witnesses tend to be used relatively infrequently, however. The Federal Judicial Center survey of federal trial court judges found that only twenty percent had appointed experts. The assumption appears to be that experts should be appointed only in unusual circumstances. *See id.* at 1445.

70. Brewer, *supra* note 9, at 1677-79.

71. *See* Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763 (2002) (discussing highly localized nature of scientific knowledge). To the contrary, expertise in one area of science may be problematic in that it leads the judge to view all other areas through the lens of that science. To be sure, general ex-

judges that was trained in a large variety of different areas of science and technology. In the patent context, this would presumably mean a trial court with at least as many specialties and subspecialties as the Patent and Trademark Office. But setting up a judicial process that is merely a higher cost version of the administrative process is unlikely to produce benefits that justify its cost. In any event, the likelihood of assembling a group of judges competent not only in law but in all of the various fields of scientific and technical endeavor relevant to the patent system is low. Moreover, to the extent that a specialized trial court incorporated juries (an issue discussed below), Brewer's proposal would require assembling a pool of jurors competent in the technical area relevant to that case. Assembling such a pool for every patent case would, at a minimum, be quite costly.

In contrast with Brewer's "two-hat" proposal, setting up a specialized trial court with lay judges who had basic training in the scientific method, and who were given sufficient resources to appoint experts liberally, would be feasible and cost-effective. To be sure, the question of how these court-appointed experts would be appointed would still be with us. As was noted earlier, lay judges do not have the training to evaluate directly the work of potential experts. In all likelihood, the rough proxy of credentials would have to serve as the relevant criterion.

Credentials are not particularly good criteria on which to ground the substantive first-order choice between opposing scientific claims. However, credentials may provide a reasonable (if far from perfect) foundation for the second-order decision regarding the individual to whom the first-order choice should be given. Relying on particular credentials to make the second-order decision is qualitatively different from relying on these credentials to make the first-order decision. To the extent that credentials are used to ground the first-order decision, the judicial process does not at any point encompass a substantive evaluation of the merits of particular claims. In contrast, when credentials are used in the second-order decision, the first-order decision is still based on substantive criteria.

A brief observation regarding the role of juries bears mention.⁷² Considerable evidence, both anecdotal and statistical, suggests that juries are particularly poor arbiters of complex scientific fact. As an anecdotal matter, patent lawyers have long observed that juries tend unduly to favor the

posure to the scientific method will be useful. General exposure to the scientific method can be achieved, however, through a basic course in research methodology. As discussed further *infra*, this basic course could be required of lay judges on a specialized trial court.

72. The role of juries is discussed more fully in Rai, *supra* note 3.

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patentee.⁷³ Similarly, Kimberly Moore's empirical study of all trial court cases that were resolved by a fact-finder between 1983 and 1999 indicates that juries are far more likely than judges to rule for the patentee—while judges rule for patentees in fifty-one percent of cases brought by the patentee, juries rule for patentees in sixty-eight percent of such cases.⁷⁴ The patentee-win rate before juries is particularly striking to the extent that defendants can be presumed to have incorporated information about pro-patentee jury bias into their decision about whether to take the case to trial before a jury in the first instance. In other words, it may be that defendants are bringing only their strongest cases to trial before a jury but still managing to lose two-thirds of the time. Because juries are highly suspect as finders of scientific fact, it is probably a good idea to cabin their role, perhaps by invoking some version of the complexity exception to the Seventh Amendment.⁷⁵

IV. ARGUMENTS AGAINST A SPECIALIZED TRIAL COURT

It could be argued that we already have a semi-specialized version of the patent trial court system proposed here. Under our current system, almost half of all patent cases are filed in about ten district courts.⁷⁶ Moreover, to the extent that these district courts do not already make routine use of court-appointed expert witnesses, they could certainly be given the resources to make liberal use of such witnesses.

This argument, however, ignores the reality that the majority of cases still go to inexperienced courts. Moreover, even if the percentage of cases filed with inexperienced courts were to decrease somewhat, it would probably be far from zero—when parties can choose between tribunals with expertise and those without, at least some parties with weak cases will gamble on nonexpert tribunals. In addition, a system that contains both expert and nonexpert tribunals in a given area cannot realize fully the efficiencies that emerge from division of labor.

The current system is also problematic in that the Federal Circuit does not give fact-finding by experienced district courts substantially greater

73. Allan L. Littman, *The Jury's Role in Determining Key Issues in Patent Cases: Markman, Hilton-Davis, and Beyond*, 37 IDEA 207, 209 (1997).

74. Kimberly A. Moore, *Judges, Juries, and Patent Cases: An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 386 (2000).

75. Use of the complexity exception would not mean that juries would be altogether excluded from the patent. They could be used to determine issues like inequitable conduct and willful infringement, where assessments of credibility and character may play a role.

76. See *supra* note 11.

weight than fact-finding by inexperienced ones. Data presented in a recent study by Christian Chu indicate that, although there is some difference in reversal rates between “more active” patent tribunals and “less active” ones, this difference is not statistically significant.⁷⁷ In contrast to our current system of semi-specialization, a specialized trial court would have the imprimatur of authority with respect to fact-finding. This added authority would presumably add to the deference given it by the Federal Circuit.

One might also worry about creating too much specialization within the patent system. Specifically, given that we already have a specialized appellate court for patents, the creation of another specialized court raises concerns about narrowness of judicial vision and possible capture.⁷⁸ These concerns are important ones. However, while concern about excessive specialization might call for reform at the level of the Federal Circuit,⁷⁹ it does not necessarily militate against the creation of a specialized court. Problems of tunnel vision and bias are likely to have much greater importance at the level of the appellate court than at the level of trial court. While trial courts decide facts in individual cases, appellate courts have the responsibility for developing the law. With respect to trial courts, the balance between expertise and vision should probably be struck in favor of expertise. In contrast, at the level of the appellate court, we should probably err on the side of broad vision. The need for balance and breadth in appellate decisionmaking is particularly acute in an area as infused by economic analysis, and as central to innovation and competition policy, as patent law.

77. Chu, *supra* note 26, at 1121-27. As noted earlier, Chu analyzed patent decisions rendered by the Federal Circuit between January 1, 1998 and April 30, 2000. The category of more active tribunals included those district courts from which the Federal Circuit reviewed more than ten cases during the studied period. The more active group also included tribunals with specialized jurisdiction that includes patents, such as the Board of Patent Appeals and Interferences, the Court of Federal Claims, and the International Trade Commission. *Id.* at 1122. Chu found that, within his studied population, the Federal Circuit tended to reverse more cases from less active tribunals than from more active ones (41% vs. 34% respectively). This tendency was not sufficiently marked, however, to have predictive implications for future cases.

78. For general discussions of such concerns, see, e.g., Harold Bruff, *Specialized Courts in Administrative Law*, 43 ADMIN. L. REV. 329, 331 (1991), Revesz, *supra* note 4, at 1120 (1990).

79. Several different mechanisms through which generalist judges could play a role at the appellate level are outlined in Rai, *supra* note 3.

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V. CONCLUSION

Proposals for reform of the patent system must confront the reality that patent law is suffused with complicated findings of scientific fact. Addressing this reality probably requires the creation of a specialized trial court with some level of expertise in scientific fact-finding. This expertise does not, however, have to come directly from the judges themselves. The more practical alternative of a system in which specialized trial court judges are provided with the resources to appoint expert consultants in many, if not most, cases is likely to produce decisions that comport with standards of intellectual due process.