

Science Court: *Past Proposals, Current Considerations, and a Suggested Structure*

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ABSTRACT

The improper bending of scientific opinion by outside influences has been a concern of scholars and commentators for decades. The interference of outside influences with scientific analysis pushed Arthur Kantrowitz in 1967 to propose a procedure for making scientific assessment by non-scientists more objective. The perception of increasing partisan influence in the mid-1970's led to a vigorous public debate of the Kantrowitz proposal. A critical question of that debate is equally important for the current judicial system: how long will we tolerate the partisan exploitation of scientific uncertainty?

This Article reviews Kantrowitz's proposal, analyzes its criticisms, and discusses how it ultimately failed to change scientific evaluation methodology. After assessing legal changes that have occurred since Kantrowitz's proposal, this Article proposes Congress should create a centralized Court of Scientific Jurisdiction to handle complex science and technology cases.

Ultimately, this Article shows that by incorporating expertise into the judiciary, the Court of Scientific Jurisdiction could objectively assess scientific and technological evidence, resulting in more reliable, predictable, and scientifically valid outcomes, without sacrificing due process and fairness.

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I. INTRODUCTION

In an era of increasing scientific complexity, extensive allegations of political pressures affecting the public presentation of science, and heightened awareness of the need to solve these problems due to a presidential election, scholars proposed a new format for the objective assessment of complex science by the scientists themselves. Was this 2008, during a presidential election following years of allegations of political influence on scientific inquiry? No. The year was 1976, and while many of the issues

debated by scholars then, such as supersonic flights, DDT, or CFC production, seem as dated as a pair of bell-bottom pants, many others such as nuclear power, global warming, air pollution, or advanced DNA research remain significant issues today.

In the mid-1970's, Dr. Arthur Kantrowitz's suggestion of an institution of scientific judgment—a science court—would receive high-level government support, and significant public attention and debate.¹ During that debate, proponents of the science court sought to purify the use of science in public discourse by incorporating several principles: the objectification of scientific inquiry, the incorporation of expertise into the decision making process, and the removal of undue involvement of other influences—political, partisan, or others—from the process.² All of these principles served the goal of increasing the accuracy and consistency of the end product.³

Kantrowitz's proposal received presidential-level support and a high-level government task force for the implementation of a formal adjudicatory system to achieve these benefits.⁴ Meanwhile, numerous critics suggested the proposals were hopelessly naïve, authoritarian, unnecessary, or improperly structured.⁵ By 1978, the development of the court had stalled politically, and it never received the full-scale test the proponents anticipated.⁶ Since the demise of Kantrowitz's proposal in the late 1970's, legal scholars have proposed several other, more limited, science court systems with varying structures and subjects, but the issue has faded and has received limited scholarly consideration for several decades.⁷

¹ Kantrowitz initially proposed the Institution in a 1967 article in *Science*. See Arthur Kantrowitz, *Proposal for an Institution for Scientific Judgment*, 156 *SCI.* 763, 763–64 (1967). Kantrowitz did not suggest the name “science court” for this Institution, but recognized the media rebranding of his idea. E.M. Leeper, *Science Court “Tried,” Cleared for Test Case*, 26 *BIOSCIENCE* 717, 717 (1976).

² For a detailed examination of these issues, see *infra* Part II.B.1–2. See generally James A. Martin, *The Proposed “Science Court”*, 75 *MICH. L. REV.* 1058 (1977); Arthur Kantrowitz, *Controlling Technology Democratically*, 63 *AM. SCIENTIST* 505 (1975).

³ See Martin, *supra* note 2, at 1059, 1071; see also Troyen A. Brennan, *Causal Chains and Statistical Links: The Role of Scientific Uncertainty in Hazardous-Substance Litigation*, 73 *CORNELL L. REV.* 469, 521 (1988) (consistency is a key issue for a centralized subject-matter-specific court); Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 *N.Y.U. L. REV.* 1, 2 (1989) (benefits of expert court include consistency); Kristin Potter, *Judicial Review of Forest Service Decisions Made Pursuant to the National Forest Management Act's Substantive Requirements: Time for a Science Court?*, 20 *J. NAALJ* 241, 257–58 (2000) (evaluating science court proposal benefits).

⁴ See Phillip M. Boffey, *Experiment Planned to Test Feasibility of a “Science Court”*, 193 *SCI.* 129 (1976); John N. Wilford, *Science Considers Its Own ‘Court’*, *N.Y. TIMES*, Feb. 29, 1976, at 140.

⁵ See, e.g., Albert R. Matheny & Bruce A. Williams, *Scientific Disputes and Adversary Procedures in Policy-Making*, 3 *LAW & POL'Y Q.* 341, 342–43, 346–50 (1981); Allan Mazur, *Science Courts*, 15 *MINERVA* 1, 9–14 (1977) (summarizing arguments of critics). For a detailed examination of the criticisms against the science court proposal, see *infra* Part II.B.3.

⁶ The Science Court was proposed as a method of resolving several disputes, most notably the placement of a high-voltage power line in western Minnesota. See Barry M. Casper & Paul Wellstone, *The Science Court on Trial in Minnesota*, *THE HASTINGS CENTER REP.*, Aug. 1978, at 5 (reviewing the attempt to use a science court in the dispute and the failure to do so); Arthur Kantrowitz, *In Defense of the Science Court*, *THE HASTINGS CENTER REP.*, Dec. 1978, at 4 (reviewing why a science court failed to be used in the Minnesota case and mentioning other events where use or suggestion of use was helpful).

⁷ This Article will focus on two varieties of later proposals: the one-subject panel incorporating science court procedures (proposed by Brennan), and the use of expert judges/juries in legal cases to resolve

Since the 1970's debate, however, a series of considerations—changes to the rules of evidence,⁸ case decisions analyzing complex science,⁹ studies of the effectiveness of judicial response to complex science,¹⁰ success of subject-matter specialty courts in other areas,¹¹ and general considerations of judicial efficiency¹²—suggests that a centralized science and technology court would advance the handling of complex expert evidence within the federal system. Therefore, this Article proposes the development of a federal Court of Scientific Jurisdiction (CSJ), formed under Article III, in order to better handle the caseload of the most detailed and complex science and technology questions.

The CSJ would be structured to achieve the same basic goals suggested by the Kantrowitz proposal of the mid-1970's: the objectification of scientific analysis, the incorporation of expertise into the decision making process, and the removal of improper influences from the presentation of the best science in the court.¹³ In addition, the court would be structured to avoid many of the criticisms expressed during the initial debate over Kantrowitz's proposal.¹⁴

By creating this specialized court, the federal judiciary as a whole would become better able, procedurally and substantively, to handle the most difficult scientific

complex cases (proposed by Luneburg and Nordenberg). For more information about these proposals see Troyen A. Brennan, *Helping Courts with Toxic Torts: Some Proposals Regarding Alternative Methods for Presenting and Assessing Scientific Evidence in Common Law Courts*, 51 U. PITT. L. REV. 1, 13–18 (1989), and William V. Luneburg & Mark A. Nordenberg, *Specially Qualified Juries and Expert Nonjury Tribunals: Alternatives for Coping with the Complexities of Modern Civil Litigation*, 67 VA. L. REV. 887 (1981). See also discussion *infra*, Part II.D.

⁸ The use of Rule 702 of the Federal Rules of Evidence as the central evaluation for admissibility of expert opinions, per *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993), and perhaps even more importantly the grant of appellate deference to the district courts on expert admissibility decisions four years later in *General Electric v. Joiner*, 522 U.S. 136 (1997), will be addressed *infra* Part III.A.

⁹ See discussion *infra* Part III.B; see, e.g., Brennan, *supra* note 3, at 491–501 (reviewing various toxic tort cases); Andrew W. Jurs, *Judicial Analysis of Complex & Cutting-Edge Science in the Daubert Era: Epidemiologic Risk Assessment as Test Case for Reform Strategies*, 42 CONN. L. REV. 49 (2009) (discussing epidemiologic risk analysis in toxic torts); John W. Osborne, Note, *Judicial/Technical Assessment of Novel Scientific Evidence*, 1990 U. ILL. L. REV. 497, 524–28 (1990) (analyzing voiceprint, blood, and other forensic evidence); Potter, *supra* note 3, at 251–56 (summarizing judicial review of agencies' environmental decisions).

¹⁰ Regarding judicial capacity to handle complex science, see Sophia I. Gatowski et al., *Asking the Gatekeepers: A National Survey of Judges on Judging Experience in a Post-Daubert World*, 25 LAW & HUM. BEHAV. 433 (2001), and Valerie P. Hans, *Judges, Juries, and Scientific Evidence*, 16 J.L. & POL'Y 19 (2007).

¹¹ See FEDERAL COURTS STUDY COMMITTEE, FINAL REPORT OF THE FEDERAL COURTS STUDY COMMITTEE 74 (1990) (discussing the successes of having a bankruptcy court); Dreyfuss, *supra* note 3, at 6–25, 74 (discussing how patent law benefits from the consolidation of cases within the Court of Appeals for the Federal Circuit); Anne Tucker Nees, *Making a Case for Business Courts: A Survey for and Proposed Framework to Evaluate Business Courts*, 24 GA. ST. U. L. REV. 477 (2007) (discussing business courts and evaluating their success); see also discussion *infra* Part III.C.

¹² See, e.g., Edward V. DiLello, Note, *Fighting Fire with Firefighters: A Proposal for Expert Judges at the Trial Level*, 93 COLUM. L. REV. 473, 482, 502–03 (1993); Dreyfuss, *supra* note 3, at 24; see also Potter, *supra* note 3, at 258.

¹³ See *supra* note 2 and accompanying text; discussion *infra* Parts II.B.1, IV.A.

¹⁴ For a brief review of the criticisms, see *supra* note 5 and accompanying text, and see discussion *infra* Parts II.B.3, IV.D.

questions. The CSJ therefore offers an alternative approach to the current system of judicial review of complex science that would offer significant improvements in the management of these difficult cases.¹⁵

Part II of this Article will review the science court proposal of the 1970's, the criticisms levied against the plan, and the aftermath including the few more limited alternatives proposed since the Kantrowitz proposal. Part III will assess the changes in the law and in the judicial system since 1976 which suggest that a specialized court should be reconsidered. Finally, in Part IV, the Article will suggest rules for the jurisdiction, structure, and procedure for a federal Article III centralized Court of Scientific Jurisdiction, formed in consideration of the principles debated during the Kantrowitz court proposal.

By reviewing the debate over Kantrowitz's *Institution for Scientific Judgment* in the 1970's, and events that have occurred since then, this Article will suggest specific systematic reforms to the federal system that would increase judges' skill in handling the most difficult technical and scientific cases.

II. THE SCIENCE COURT PROPOSAL AND DEBATE OF THE 1970'S, AND ITS AFTERMATH

The story of the history, development, and eventual collapse of the Kantrowitz science court proposal in the 1970's provides valuable insight into the challenges of objectifying the presentation of scientific facts.

The proposal for an objectification of scientific inquiry started in the 1960's, during a period when scholars recognized that the existing mechanisms for scientific review had become inadequate.¹⁶ By the mid-1970's, the science court proposal had received significant political backing from the White House, resulting in a Task Force committee adopting a comprehensive proposal, then submitting it for comments at a public forum in September 1976.¹⁷ Critics attacked multiple aspects of the proposals, charging the science court structure proposed by the Task Force was "profoundly naïve, internally inconsistent, and inherently unworkable,"¹⁸ or represented an authoritarian approach to science evocative of George Orwell's *1984*.¹⁹

Following the public forum of September 1976, the science court proponents

¹⁵ On this point, see Joseph Sanders, *Science, Law, and the Expert Witness*, 72 LAW & CONTEMP. PROBS. 63, 77 (2009) (noting that science courts and other mechanisms tend to lessen the adversarial nature of expert testimony—whether given by expert panels, neutral experts, or court-appointed experts—and offer improvements over the status quo).

¹⁶ See *infra* Part II.A.

¹⁷ See Arthur Kantrowitz, *The Science Court Experiment*, 17 JURIMETRICS J. 332, 332, 340 (1977); see also *infra* Part II.B.2.

¹⁸ Robert S. Banks, *The Science Court Proposal in Retrospect: A Literature Review and Case Study*, 10 CRC CRIT. REV. ENVTL. CONTROL 95, 128 (1980); see also *infra* Part II.B.3.

¹⁹ See Dorothy Nelkin, *Thoughts on the Proposed Science Court*, SCI., TECH., & HUM. VALUES, Jan. 1977, at 20, 25 (unattributed quote highlighting the critics' reactions to the Kantrowitz proposal); see also *infra* Part II.B.3.

anticipated a full-scale test case, but political support decreased significantly after the November election.²⁰ Before 1980, the proposal had been raised as a potential solution to resolve a controversial regional electrical routing issue, but the Kantrowitz proposal was never tested on this or any other real issue of significant magnitude.²¹ By 1980, the Kantrowitz science court was no longer receiving serious consideration.²² During the next decades, several alternatives arose that incorporated aspects of the Kantrowitz proposal, but none gained significant attention comparable to their predecessor.²³

How the science court proposal developed, received substantial attention, and then collapsed provides an example of a significant attempt to objectify the public presentation of scientific facts, and gives useful insight for any future attempts to do the same.

A. The Rise of the Institution for Scientific Judgment

In the late 1960's, academic commentators recognized that the state of scientific fact-finding within the public realm—whether judicial case analysis or political assessment—had become intolerable. The Kantrowitz proposal was a direct response to this state of affairs.

In an influential article from 1966, Harold Korn reviewed the manner in which courts analyzed technical materials in their decisions.²⁴ Korn recognized that current judicial methods to consider complex evidence, particularly in advanced scientific fields, was patently unworkable.²⁵ Judicial handling of science suffered from procedural weaknesses, such as the adversarial presentation of expert witnesses,²⁶ in addition to substantive difficulties with the scientific method.²⁷ He concluded, “Built into the [judicial] system is an extreme tolerance for low-accuracy results.”²⁸

Korn decided that the failure to modify the judicial system to handle these complex technical or scientific materials suggested that the “major stresses of scientific and technical advance [would] be borne by legislative and administrative innovation.”²⁹

²⁰ See Casper & Wellstone, *supra* note 6, at 5–7; see also *infra* Part II.C.

²¹ See Casper & Wellstone, *supra* note 6, at 5; Kantrowitz, *supra* note 6, at 4; see also *infra* Part II.C.

²² See, e.g., Allan Mazur, *The Science Court: Reminiscence and Retrospective*, 4 RISK 161, 161, 165 (1993) (dating the end of the proposal to the presidential succession of 1977, and considering the issue to be a byproduct of the contentious 1970's); Abraham Sofaer, *The Science Court: Unscientific and Unsound*, 9 ENVTL. L. 1, 3–15 (1978) (attacking the argument that the science court is needed and suggesting that Kantrowitz and proponents make their case); see also *infra* Part II.D.

²³ See Brennan, *supra* note 3, at 524–30; Brennan, *supra* note 7, at 10–19; Luneburg & Nordenberg, *supra* note 7, at 887; see also *supra* note 7 and accompanying text. See generally *infra* Part II.D.

²⁴ See Harold L. Korn, *Law, Fact & Science in the Courts*, 66 COLUM. L. REV. 1080, 1080 (1966).

²⁵ *Id.* at 1080 n.3 (citing David F. Cavers, *Introduction, Science and Law Symposium*, 63 MICH. L. REV. 1325, 1326 (1965)).

²⁶ *Id.* at 1080.

²⁷ *Id.* at 1094.

²⁸ *Id.* at 1115.

²⁹ *Id.* at 1116 n.119 (citing Walter Gellhorn, *Stability and Change Through Law: The Legislative and Administrative Response*, 17 VAND. L. REV. 91, 104 (1963)).

Arthur Kantrowitz came to the same conclusion the next year.

In his 1967 article, *Proposal for an Institution for Scientific Judgment*, Dr. Kantrowitz wrote his initial suggestion that scientific analysis being considered in policy debates should be objectified through formal processes.³⁰ Kantrowitz saw that the advances in applied research made decision making difficult since the decisions involved “mixed decisions” of cutting-edge science and political or moral components.³¹ Since science had become enmeshed in these mixed decisions, society needed a method for determining “hard scientific fact,” to be used to decide critical pressing issues of the day, when the decision must occur prior to the development of scientific consensus.³² Crucially, Kantrowitz rejected the traditional scientific assessment method, the scientific advisory committee, because committees often had members with preconceived ideas, and often lacked public accountability.³³

To better assess scientific issues in public debate, Kantrowitz proposed institutionalizing the scientific advisory process to increase objectivity in the results.³⁴ First, Kantrowitz proposed that the scientific fact analysis should be separated from the political or moral component of a mixed decision, to increase the scientific objectivity.³⁵ Next, the role of the judge must be separated from the role of the advocate. Kantrowitz wrote that an informed final decision on an issue requires an objectivity lacking in those who must advocate for adoption of one of many alternative positions on an issue.³⁶ Finally, he thought the results of the process—the final decision or rendering of judgment—should be published for review by the public.³⁷ Publication permits others to later use the decision, or the underlying analysis or bases for the decision, in their assessment of similar issues, but also provides accountability to the judges in the process.³⁸ With these three elements, Kantrowitz suggested a procedure by which scientific components of public issues could be rationally and objectively analyzed, and a final decision made.³⁹ In comparison to the high profile arguments over the Kantrowitz proposal years later, the article failed to generate widespread debate after initial publication in 1967.

In the early 1970’s, several other articles discussed similar issues of scientific assessment, prior to the public debate over Kantrowitz’s proposal in the mid-1970’s. In 1972, Alvin Weinberg discussed the issue of the separation of the scientific components

³⁰ See Kantrowitz, *supra* note 1, at 763.

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ *Id.* (proposing measures for “increasing the presumptive validity of the scientific input” into decision making).

³⁵ *Id.*

³⁶ *Id.* at 764.

³⁷ *Id.*

³⁸ *Id.*

³⁹ Like the analysis by Korn, Kantrowitz saw this as a method for assessment of public policy in the legislative or administrative realm. Of course, the methods can be applied to the judicial realm as well. See *infra* Part IV.

of complex issues from the “trans-scientific”—moral and political—parts.⁴⁰ In doing so, scientists could research the scientific issues, but when commenting on the trans-scientific parts must recognize that their specialized knowledge no longer holds sway.⁴¹ Weinberg also suggested an adoption of adversarial procedures for trans-scientific debate, an approach later adopted as part of the Kantrowitz proposal.⁴² A separate proposal in 1973 by Scott Whitney involved development of a specialized environmental court to harness expertise in the interests of increasing accuracy of outcomes.⁴³ The Weinberg and Whitney articles demonstrate the recognition that existing institutions and methods for analysis of complex scientific materials may be inadequate, and that additional methods could further objectify the process.

Perhaps as a result of this additional scholarly debate, Dr. Kantrowitz again proposed the institutionalization of scientific evaluation in an article published in the *American Scientist* in 1975.⁴⁴ Kantrowitz reintroduced his original three recommendations to increase scientific objectivity in mixed decisions: separation of the scientific from the moral/political parts of a decision, separation of judge and advocate, and publication of all results.⁴⁵ In addition to these suggestions dating to his 1967 proposal, however, Kantrowitz expanded his discussion of the methods for making decisions, adopting an adjudicatory approach to the process.⁴⁶ Specifically, the updated proposal recommended the assigned advocate for a position in a debate be permitted to expose weaknesses in the opposing viewpoint through cross-examination.⁴⁷ The updated proposal also recommended that, since the judicial role is so critical to objective results, that it “requires the development of a group of distinguished people who will devote themselves to scientific judgment.”⁴⁸

The Kantrowitz addition of adversarial procedures and an institutionalized judiciary to his initial science panel approach shifted away from a temporary scientific advisory committee to a true and permanent science court.⁴⁹ The Kantrowitz proposal had also reached a near-final form that would allow for the full and detailed debate between scholars and commentators that would take place in the following years.

⁴⁰ See Alvin M. Weinberg, *Science and Trans-Science*, 10 MINERVA 209 (1972).

⁴¹ *Id.* at 220.

⁴² *Id.* at 215; see *infra* text accompanying note 46.

⁴³ Scott C. Whitney, *The Case for Creating a Special Environmental Court System*, 14 WM. & MARY L. REV. 473, 522 (1973) (“Environmental issues are probably more complex and specialized than tax issues, and hence courts having special expertise appear to be highly desirable, if not absolutely necessary.”).

⁴⁴ Kantrowitz, *supra* note 2, at 506.

⁴⁵ *Id.* at 506–08.

⁴⁶ *Id.* at 507.

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ Allan Mazur, one of the members of the presidential-level task force in 1976, dates the use of the term “science court” to February 1976, when it was used by Daniel Greenberg. Mazur, *supra* note 22, at 164 (citing Daniel Greenberg, *Plans Proceeding for “Science Court” Experiment*, SCI. & GOV’T, Feb. 15, 1976, at 3).

B. The Critical Period of 1976–1977: Proposed Structure and Criticism

In the few years following the *American Scientist* article, the Kantrowitz science court proposal obtained prominence in the scientific and mainstream media and received presidential-level support,⁵⁰ leading to a public forum on the proposal in September 1976,⁵¹ endorsement by twenty-eight leading scientific organizations,⁵² and the questioning of presidential candidates of 1976 regarding their positions on the issue.⁵³ The proposal also resulted in significant criticism as well, and in 1977 the political climate shifted.

1. The Purposes Served by the Kantrowitz Science Court

Kantrowitz designed his plan with three overarching principles: to purify scientific fact-finding to allow the predominance of the science to hold sway, to capture expertise in the role of arbiter to better manage the complexities of inquiry, and to prevent distortion of the science by outside political, social, or other interfering forces.⁵⁴

First, the science court was proposed to purify scientific inquiry by focusing on the quality of the science on each side, rather than on the persuasiveness or title of the advocate.⁵⁵ The result of this procedure would have been a statement on “the current state of technical knowledge . . . [to] provide defensible, credible, technical bases for urgent policy decisions.”⁵⁶ This would have isolated the issue on which the scientists disagree, allowed for an objective analysis of the science on the issue, and then presented an objective decision explaining the current state of science in the area.

Second, the science court was proposed to capture expertise in the role of the judge, to allow for more accurate and efficient decision making. The proposal adopted the position that an expert judge is better able to accurately handle the complexities of complex subject matter, resulting in improved substantive results.⁵⁷ The expert judge

⁵⁰ Wilford, *supra* note 4, at 140.

⁵¹ See Kantrowitz, *supra* note 17, at 340; Leeper, *supra* note 1, at 717; Wil Lepkowski, *Science Court on Guard*, 263 *NATURE* 454, 455 (1976).

⁵² John Noble Wilford, *28 Leaders Endorse Science Court Test*, *N.Y. TIMES*, Jan. 2, 1977, at 28.

⁵³ *Carter and Ford Detail Their Ideas on Science and Technology for C&EN*, *CHEM. & ENG. NEWS*, Oct. 18, 1976, at 28. In addition, for a discussion specifically regarding President Carter, see Howard T. Markey, *A Forum for Technocracy? A Report on the Science Court Proposal*, 60 *JUDICATURE* 365, 371 (1977) (“Mr. Carter . . . recognizes the need for ‘objective evaluations of scientific evidence’ and for more ‘objective scientific fact determinations.’” (internal citation omitted)). For a short discussion regarding the stance of President Ford’s scientific advisers, see Wilford, *supra* note 52, at 28. See also American Bar Association, Section of Science and Technology, *Curbing Ignorance and Arrogance: The Science Court Proposal and Alternatives*, 19 *JURIMETRICS J.* 385, 391 (1979) (comments of Dr. Kantrowitz).

⁵⁴ These interests will be the basis of the proposed judicial science court, *infra* Part IV.A.

⁵⁵ Kantrowitz, *supra* note 2, at 509 (rejecting the “insider” Washington scientific advisor whose positions reflect science as well as moral and political motives, and rejecting the abuse of science as a “smokescreen” for other rationales).

⁵⁶ Task Force of the Presidential Advisory Group on Anticipated Advances in Science and Technology, *The Science Court Experiment: An Interim Report*, 193 *SCI.* 653, 653 (1976) [hereinafter Task Force].

⁵⁷ Martin, *supra* note 2, at 1059; see also John Thibaut & Laurens Walker, *A Theory of Procedure*, 66 *CAL. L. REV.* 541, 564 (1978) (“If questions of science and technology are at issue, the decisionmaker

would have also more efficiently handled complex material because there would have been no need to learn, for each case, basic aspects of the scientific material.⁵⁸ The procedural efficiency was critical to the mission of the science court.⁵⁹ Procedural efficiency would have also increased as any expert judge would, over the time he or she remained on the bench, become familiar with several complex areas.⁶⁰ Harnessing expertise in the interests of better, more efficient decisions was a key attraction of the science court proposal.

Finally, the science court proposed to eliminate the role of improper forces—ranging from the role of self-interest to interference from political, moral, or adversarial influences—on scientific debate.⁶¹ Kantrowitz lamented that scientists allowed outside influences to interfere with their work, and wished to eliminate those influences for a better scientific result.⁶² The science court proposed to eliminate these distortions by removing the non-scientific aspects of the issue from the science, then issuing a final opinion judging the science alone.⁶³ Only then could others have used the opinion for final assessment of policy choices. The proposal also could have reduced a popular perception that scientists tend to meddle in other fields beyond their expertise.⁶⁴ The key development was to remove the scientific inquiry away from spoliation by corrupting influences.

The Kantrowitz science court proposal sought to focus scientific inquiry solely on the quality of the science, harness expertise in the role of the judge, and eliminate distortion from undue influence of outside interests. By focusing on these goals, the proposal gained significant support.

2. The Presidential Task Force and More Detailed Proposals

The 1975 article by Dr. Kantrowitz sparked discussion on the issue of objective means of analyzing science, and it gained significant support within a very short period of time. Likened to a “sky rocket” by a proponent of the plan, the rapid rise presaged an

should be a scientist (or panel of scientists) who is fully capable of evaluating the particular claims in dispute.”).

⁵⁸ This would hold true even if the judge is not from the exact discipline of the dispute, but a related discipline. Kantrowitz suggested this offsetting of expertise field to reduce the possibility of preconceived opinions from entering judgments. Arthur Kantrowitz, *The Science Court – Another Alternative*, 18 PTC J. RES. & ED. 61, 64 (1976). For additional analysis of this issue, see Jeffrey A. Martin, Note, *Procedures for Decisionmaking Under Conditions of Scientific Uncertainty: The Science Court Proposal*, 16 HARV. J. ON LEGIS. 443, 491–92 (1979).

⁵⁹ DiLello, *supra* note 12, at 482; see also Potter, *supra* note 3, at 258.

⁶⁰ DiLello, *supra* note 12, at 502; Scott C. Whitney, *The Case for Creating a Special Environmental Court System – A Further Comment*, 15 WM. & MARY L. REV. 33, 48 (1973).

⁶¹ Arthur Kantrowitz, *Elitism vs. Checks and Balances in Communicating Scientific Information to the Public*, 4 RISK 101, 111 (1993); Kantrowitz, *supra* note 2, at 509; Sterling Seagrave, *Science Court: Test Case this Year?*, 26 BIOSCIENCE 377, 380 (1976).

⁶² American Bar Association, *supra* note 53, at 388; Kantrowitz, *supra* note 58, at 62; Kantrowitz, *supra* note 2, at 506; Martin, *supra* note 2, at 1059.

⁶³ Kantrowitz, *supra* note 2, at 508.

⁶⁴ Kantrowitz, *supra* note 58, at 64; Martin, *supra* note 2, at 1059.

equally rapid descent from prominence.⁶⁵

In early 1976, the Ford administration began formal review of the Kantrowitz proposal through a committee within the White House Office of Science and Technology Policy.⁶⁶ Dr. Kantrowitz served as chair of the committee, which also included prominent academics and government officials.⁶⁷ After several months of review, the committee published their initial findings and proposal on a science court.⁶⁸ The Task Force Interim Report adopted most of the Kantrowitz *American Scientist* proposal for scientific adjudication, and then added or clarified several details.⁶⁹ First, the Task Force proposed that the selection of advocates for presenting the sides of a contested issue would involve the court soliciting case proposals by interested groups, and then the court would select specific proponents by “processes similar to those used in selecting contractors for other purposes.”⁷⁰ Next, the proposal suggested that, in order to fund a test case, the National Science Foundation should approve a grant for costs of the first case.⁷¹ Finally, the panel suggested that after the court used the adversarial procedures suggested by Kantrowitz in a specific proceeding, the court should issue a final statement of opinion.⁷² The Task Force clarified that the court’s opinion should include uncontested statements of advocates, contested statements with findings by the court on the issue, and areas where no finding could be made due to the lack of basis to make a finding.⁷³

In the Interim Report, the Task Force also notified scientific and legal scholars and theorists of its intent to host a public meeting to openly discuss the proposal and listen to the opinions of others.⁷⁴ The meeting was held in Leesburg, Virginia, in September 1976, and involved over 250 participants.⁷⁵ While the many accounts of the meeting disagree on the level of support for the Interim Report’s proposals,⁷⁶ several undisputed results include the following: the airing of disagreements by critics of the proposal, the restatement of the Task Force’s intention to implement a test case using the proposed procedures, and a high level of scholarly and public interest that the meeting generated.⁷⁷ By this point, Kantrowitz suggested that funding from the NSF would be the

⁶⁵ Mazur, *supra* note 22, at 161; *see infra* Part II.C.

⁶⁶ Mazur, *supra* note 5, at 6–7; *Science Court: An Idea in Search of a Need*, 10 ENV. SCI. & TECH 1088, 1088 (1976) [hereinafter *Science Court*].

⁶⁷ *See* Task Force, *supra* note 56, at 653.

⁶⁸ Seagrave, *supra* note 61, at 378; Task Force, *supra* note 56, at 653.

⁶⁹ Task Force, *supra* note 56, at 653–55.

⁷⁰ *Id.* at 654.

⁷¹ *Id.*

⁷² *Id.* at 654–55.

⁷³ *Id.* at 655.

⁷⁴ *Id.* at 656.

⁷⁵ Kantrowitz, *supra* note 17, at 340; Lepkowski, *supra* note 51, at 455.

⁷⁶ Kantrowitz, *supra* note 17, at 340 (“On the whole, the meeting was characterized by an endorsement of the proposal . . . [with] notable exceptions . . .”); Leeper, *supra* note 1, at 717 (“The opposition was clearly in the minority . . .”); Lepkowski, *supra* note 51, at 455 (noting that the meeting was a “mélange of speculation” where “nothing was really decided”).

⁷⁷ Leeper, *supra* note 1, at 718.

sole barrier to a comprehensive science court test case proposed by the Task Force.⁷⁸ By any account, the Leesburg meeting clearly demonstrated rising prominence of the proposal, but also showed mounting criticism and opposition. Optimism regarding the proposal had reached its zenith.⁷⁹

3. Criticism of the Proposal

The Leesburg meeting may have resulted in a conclusion that the science court would be tried by use of a test case, but the proposal most definitely was not universally admired. Prominent critics of the Task Force Interim Report proposal attacked multiple aspects of the plan. All in all, the critics believed the proposal was “profoundly naive, internally inconsistent, and inherently unworkable.”⁸⁰

i. Procedural Objections

Many of the critics disagreed with the procedural mechanisms the science court would have employed. Some suggested that the separation of scientific facts from political/moral issues could not be done, and the procedures and case management process was a consequence of the “naive” beliefs of the proponents.

Major criticism to the Interim Report first arose in a letter to *Science* in September 1976, prior to the Leesburg meeting.⁸¹ In the letter, Professor Earl Callen suggested that the science court’s initial procedural step—to separate the facts and then analyze the science regarding those facts—was unlikely to work since facts could not so easily be separated out from other issues.⁸² In a similar criticism, Barry M. Casper flatly noted that the separation of scientific facts from the other moral influences in a decision could not be done, by saying, “Is [the court’s selection of issues, or] choice of the significant questions independent of political and value judgments? In general it is not.”⁸³ Casper continued that, even if it was possible to separate the facts from the moral components, it would not be desirable to do so because only with the addition of the other considerations beyond facts do the issues become important.⁸⁴ Casper decided the Task Force proposal, by addressing only scientific facts without consideration of the moral or political components of policy choices, was “just the reverse of what [was] needed.”⁸⁵ Other prominent critics adopted this criticism of the Task Force proposal.⁸⁶

⁷⁸ Kantrowitz, *supra* note 17, at 340; ‘*Science Court*’ Idea: Toward a Test, 110 SCI. NEWS 198, 199 (1976).

⁷⁹ Mazur, *supra* note 22, at 165. Regarding the zenith, and the fall therefrom, see discussion *infra* Part II.C.

⁸⁰ Banks, *supra* note 18, at 128.

⁸¹ See Earl Callen, *The Science Court*, 193 SCI. 950, 950–51 (1976).

⁸² *Id.*

⁸³ Barry M. Casper, *Technology Policy and Democracy*, 194 SCI. 29, 30 (1976).

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ See, e.g., Matheny & Williams, *supra* note 5, at 345; Nelkin, *supra* note 19, at 24–25; Richard E. Talbott, “*Science Court*”: A Possible Way to Obtain Scientific Certainty for Decisions Based on Scientific “Fact”?, 8 ENVTL. L. 827, 838–40 (1978).

Another criticism of the science court procedure was that the court's selection of both judges and advocates would not work as suggested in the Task Force Interim Report.⁸⁷ Barry Casper criticized the need for any judges to be appointed, suggesting that the Task Force proposal assumed that the current decision makers are unable to properly weigh the scientific facts on decisions that do not require a technical background.⁸⁸ He also suggested that if the public were adequately involved in policy debates earlier, then there would be no need for scientific judges to make decisions on behalf of others.⁸⁹ Dorothy Nelkin agreed with Casper that judges would be problematic, stating that judges could not be selected without predisposition, and further suggested that the advocate selection procedures were untenable.⁹⁰ Finally, Richard Talbott suggested an inherent contradiction in the selection process: anyone competent to understand the technical issues in dispute is excluded, since they have likely "developed rather clear and firmly held views of what the status of science is."⁹¹

Finally, critics attacked the science court's use of adversarial procedures for adjudication of scientific disputes. They argued that adversarialism emphasizes winning more than the search for truth, and it is extremely expensive.⁹² Some noted that the method of adversarialism is antithetical to the method of developing fact in science.⁹³ Specifically, Professor Sofaer noted that the adversarial procedure is "peculiarly ill-suited" to the task of finding truth, since it emphasizes due process, fairness, neutrality, and process over discernable validity.⁹⁴ Essentially, what the science court was proposing, said other critics, was confusing a "fair" hearing with one focused on accuracy.⁹⁵ The result could be a "false validity" with potential to limit future inquiry.⁹⁶ One critic called the attempt to use adversarial procedures in development of consensus in science "naïve" and unworkable.⁹⁷

At the Leesburg meeting in September 1976 and in articles produced during the debate on the Kantrowitz proposal, many critics rejected the procedures proposed by the Task Force Interim Report as ill-suited to the purposes of the court, naïve, and impractical.

ii. Substantive Objections

In addition to the procedural attacks, other critics opposed the way substantive

⁸⁷ Task Force, *supra* note 56, at 654 (proposing that advocates be selected from existing proponents of a position or selected by soliciting proposals, and that judges be selected by scientific agency collaboration); *see also supra* text accompanying note 70.

⁸⁸ Casper, *supra* note 83, at 31.

⁸⁹ *Id.* at 32.

⁹⁰ Nelkin, *supra* note 19, at 23–24.

⁹¹ Talbott, *supra* note 86, at 841.

⁹² Markey, *supra* note 53, at 369; Nelkin, *supra* note 19, at 24.

⁹³ *See* Talbott, *supra* note 86, at 833–34.

⁹⁴ Sofaer, *supra* note 22, at 20.

⁹⁵ *See* Matheny & Williams, *supra* note 5, at 348.

⁹⁶ *See id.* at 350. Regarding the issue of authoritarianism and its effects, see the discussion *infra* Part II.B.3.ii.

⁹⁷ Banks, *supra* note 18, at 128.

results of the court would be used. Blasting the proposal as an imposition of new scientific authoritarianism, and suggesting parallels to Orwell's *1984* or Galileo's trial, the critics alleged the procedures used would hinder true scientific advancement.

Almost from the beginning, critics suggested that the court would bring an authoritarian finality to scientific inquiry, stifling debate by smashing dissent. Even before Leesburg, critics suggested that the procedure would be an "ominous" threat to free discussion of serious issues in science, and "a very serious attempt to reintroduce authoritarianism in science."⁹⁸ At Leesburg, critics questioned whether less prominent scientists could challenge the pronouncements of a supreme court of science.⁹⁹ Decisions could also be construed as more authoritative than intended by the authors, if the findings were read as definitive and subtleties and qualifications on the decision were lost.¹⁰⁰ In the most extreme forms, critics suggested the court was a form of *1984* technocracy, or reminiscent of the Church's censorship of Galileo.¹⁰¹ Even without realizing these high-level fears, critics suggested that the authoritative aspect of the court's pronouncements could seriously reduce science funding for researchers adopting a minority viewpoint.¹⁰²

Concerns about the proper use of any results were not the only issues raised. Later critics focused on output measures of analysis, noting that in the primary example of a science court "in action," the procedure failed.¹⁰³ The Minnesota power line controversy of 1977 and 1978 resulted in negotiations over the implementation of a science court, in deciding on the placement of a high-voltage electrical line.¹⁰⁴ However, the parties never agreed to science court procedures, and Kantrowitz and the Task Force would never have a chance to perform a full-scale test of the proposal in any other controversy.¹⁰⁵

With the charge of scientific authoritarianism leveled, and critics suggesting the procedures were ill-suited to resolving scientific disputes, critics had attacked the science court as both impractical and dangerous.

C. The Demise of the Kantrowitz Science Court

Following Leesburg and despite the criticism, the Task Force proposal appeared to have reached the cusp of success, having navigated the shoals of political endorsement and survived open debate. By January 1977, twenty-eight prominent scientific

⁹⁸ Boffey, *supra* note 4, at 129 (quoting Barry Commoner, the chairman of the Scientists Institute for Public Information); *see also Science Court, supra* note 66, at 1089.

⁹⁹ *See* Leeper, *supra* note 1, at 718.

¹⁰⁰ *See* Nelkin, *supra* note 19, at 25.

¹⁰¹ *See* Martin, *supra* note 2, at 1085; Nelkin, *supra* note 19, at 25.

¹⁰² *See* Martin, *supra* note 2, at 1085.

¹⁰³ Whether the Minnesota case actually involved the use of a science court was vigorously debated, as Dr. Kantrowitz felt the procedure had not been implemented but only threatened, while others saw it as definitive proof of the failure of the concept. *Compare* Kantrowitz, *supra* note 6, at 4, *with* Donald Christiansen, *The Science Court Tested*, 16 IEEE SPECTRUM 27 (1979).

¹⁰⁴ For more details on the Minnesota power line controversy, see the discussion *infra* Part II.C.1.

¹⁰⁵ *See infra* Part II.C.

organizations offered their support.¹⁰⁶ In addition, the final perceived impediment to a true full-scale test, a grant from NSF, appeared to be imminent.¹⁰⁷ Yet the issue faded as a full-scale test case failed to materialize.

1. Full-Scale Testing of the Procedure Never Occurs

Once the Task Force proposed a science court, and met to resolve issues at Leesburg, a test case was the next logical step.¹⁰⁸ After the Leesburg meeting, the new governor of Minnesota in early 1977 suggested the use of the procedure for adjudication of a dispute regarding a high-voltage power line in western Minnesota.¹⁰⁹ While a preliminary grant of funds resulted in a mediator opening negotiations between the utilities and the opponents of the lines, the mediator's attempts to get the parties to agree to a full science court never succeeded.¹¹⁰ By the spring of 1978, the proposal failed to advance and no science court convened.¹¹¹ The Minnesota power line controversy had provided a high-profile issue for the science court to attempt to resolve, but without the parties agreeing to it, no formal sessions ever occurred.¹¹² Proponents blamed the advanced stature of the dispute prior to the attempt to invoke a science court,¹¹³ but the results were largely seen as a failure of the concept itself.¹¹⁴ Critics pounced, suggesting the Minnesota controversy proved the proposal would never work.¹¹⁵

While Minnesota provided the highest profile example of an attempt to use a science court prior to 1980, several other examples of the proposed use of the procedures merit mention. In direct response to the perceived failure in Minnesota, Dr. Kantrowitz noted the procedure, or threat thereof, had worked in two other situations prior to 1979: on the issue of routine x-ray examinations for breast cancer for women under 50, and on the issue of design alternatives of fusion reactors.¹¹⁶ Kantrowitz noted that the threat of using a science court had brought parties to the table to discuss the merits of routine x-ray screening of younger women for breast cancer, and that the result was a change in the official recommendation from professional societies.¹¹⁷ In the case of fusion reactors, Kantrowitz noted that a science court had been successfully employed by the Department

¹⁰⁶ See Wilford, *supra* note 52, at 28. These included the American Association for the Advancement of Science, the American Chemical Society, and the American Physical Society. *Id.*

¹⁰⁷ See *supra* note 79 and accompanying text; *A Plan to Test 'Science Courts'*, BUS. WEEK, Jan. 17, 1977, at 58 (reporting that the NSF was preparing to accept bids on test proposals); see also Banks, *supra* note 18, at 120 (noting that the NSF "would have considered a larger grant to fund" the Minnesota case, had the science court been agreed to by the parties) (citing Casper & Wellstone, *supra* note 6, at 6). For more discussion of the Minnesota case, see *infra* Part II.C.1.

¹⁰⁸ See Markey, *supra* note 53, at 371 (stating that proponents of the proposal and at least some opponents endorsed the idea of conducting one science court as an experiment).

¹⁰⁹ For a detailed review of the controversy, see Banks, *supra* note 18, at 120–28.

¹¹⁰ See Casper & Wellstone, *supra* note 6, at 6.

¹¹¹ See Banks, *supra* note 18, at 127.

¹¹² See *supra* Part II.B.3.ii.

¹¹³ See Christiansen, *supra* note 103, at 27.

¹¹⁴ See Banks, *supra* note 18, at 129; see also Casper & Wellstone, *supra* note 6, at 7.

¹¹⁵ See generally Casper & Wellstone, *supra* note 6, at 7.

¹¹⁶ American Bar Association, *supra* note 53, at 391; Kantrowitz, *supra* note 6, at 4.

¹¹⁷ Kantrowitz, *supra* note 6, at 4.

of Energy's predecessor in evaluating proposals for magnetically-contained fusion.¹¹⁸ While these examples heartened the science court's chief proponent, the Minnesota example appeared to many to be a definitive failure, and no full-scale federal test—as suggested by the Task Force¹¹⁹—materialized.

2. Political Will

The change in the political circumstances in 1977 also drastically affected the prospects for the science court.

The Ford Administration had empowered the Task Force to evaluate the science court proposal and hold the Leesburg conference in September 1976. Prior to the 1976 presidential election, both candidates had endorsed the principle of a science court.¹²⁰ President Ford's commitment to continue the science court concept if elected seemed clear.¹²¹ President-elect Carter also endorsed the general principle of a science court even in late-1976.¹²² As the inauguration approached, however, the commitment of the Carter Administration to achieve a full-scale test of the science court faded without comment.¹²³

The political death of the science court essentially ended the Task Force's quest for a grand experiment. Dr. Kantrowitz suggested that this failure to truly test the procedure was unsurprising since it "became clear that although both sides of the Washington politics-science complex would give lip service to the need for new procedures, they were unwilling to aid in creating an institution that might not be easy to control."¹²⁴ The issue retained enough profile to require Republican presidential nominee Ronald Reagan to take a position on the science court in 1980, endorsing the public discussion of controversial science.¹²⁵ By the election of 1980, however, Kantrowitz's science court proposal, so ballyhooed in 1976, was essentially over; the sky rocket had crash landed.¹²⁶

D. The Postscript

Following the science court controversy of the mid-1970's, the idea of a Kantrowitz-style science court faded into relative obscurity. With few exceptions, the articles that discussed the Kantrowitz proposal mainly rejected it as an unrealistic or unlikely possibility, while much of the academic commentary—to the extent anyone discussed science courts—supported vague alternative approaches.¹²⁷ During this period,

¹¹⁸ *Id.*; see also American Bar Association, *supra* note 53, at 391.

¹¹⁹ Task Force, *supra* note 56, at 656; Wilford, *supra* note 4, at 140.

¹²⁰ American Bar Association, *supra* note 53, at 391 (citing CHEM. & ENG. NEWS, *supra* note 53, at 28)

¹²¹ Wilford, *supra* note 52, at 28.

¹²² Markey, *supra* note 53, at 371.

¹²³ American Bar Association, *supra* note 53, at 391; see also Mazur, *supra* note 22, at 165.

¹²⁴ Kantrowitz, *supra* note 61, at 108.

¹²⁵ Arthur Kantrowitz, *A Response to Matheny and Williams*, 3 LAW & POL'Y Q. 365, 367 (1981) (citing PHYSICS TODAY, Oct. 1980, at 50).

¹²⁶ See Mazur, *supra* note 22, at 161, 165.

¹²⁷ See, e.g., Eugene Garfield, *Contemplating a Science Court: On the Question of Institutionalizing Scientific Factfinding*, 1 SCIENTIST 9 (1987); American Bar Association, *supra* note 53, at 397 (comments

several small-scale uses of the procedures were attempted, mostly on university campuses, but a full-scale test would never again get closer to implementation.¹²⁸ By the period of the mid-1990's to early 2000's, commentators who mentioned the science court proposal concluded that the potential for objective science court procedures was "grim,"¹²⁹ or that Congress would never agree to any science court.¹³⁰

In contrast to the dominant academic currents of the post-Kantrowitz period, two alternatives to a high-level and comprehensive Kantrowitz science court were proposed: the development of "blue ribbon" or specialized juries or judges to handle complex cases, and subject-specific science courts or panels for particularly complex materials.¹³¹ Each is interesting in its approach to objective science, but each received little of the prominent debate and consideration for implementation of the Task Force Interim Report.

The first post-Kantrowitz science court proposal came from an article written by William Luneburg and Mark Nordenberg in the *Virginia Law Review* in 1981.¹³² In the article, the authors lamented the state of the jury's ability to handle increasingly complex litigation in federal court.¹³³ Concluding that "it is not at all clear that the abilities of juries have kept pace" with the complexities of modern life,¹³⁴ Luneburg and Nordenberg suggested two alternatives: using a "special" jury composed of college-educated jurors, or creating an expert nonjury tribunal.¹³⁵ They argued that special juries may be permissible under the Seventh Amendment jury trial right since the competence of the jury to hear the case may be considered a factor empowering courts to create a specially-qualified jury.¹³⁶ A specially-qualified jury would be, as a general proposition, better than a normal jury, they argued, because formal education results in not only the direct development of skills or knowledge, but also the ability to transfer that knowledge to new

of Mr. Loevinger); John W. Wesley, Note, *Scientific Evidence and the Question of Judicial Capacity* 25 WM. & MARY L. REV. 675, 691 (1984).

¹²⁸ Kantrowitz, *supra* note 61, at 109. See generally Roger R. Masters & Arthur R. Kantrowitz, *Scientific Advisory Procedures; The SDI Experiments at Dartmouth*, in TECHNOLOGY AND POLITICS 278 (Michael Kraft & Norman Vig, eds. 1988); Deborah Illman & David Von Beck, *Who Knows? The Search for Understandable Science*, SEATTLE TIMES, July 12, 1991, at A11 (reviewing science court use in a University of Washington review of bovine growth hormones).

¹²⁹ Potter, *supra* note 3, at 261.

¹³⁰ *Confronting the New Challenges of Scientific Evidence*, 108 HARV. L. REV. 1583, 1604 (1995); Robert L. Hess, II, Note, *Judges Cooperating with Scientists; A Proposal for Mote Effective Limits in the Federal Judge's Inherent Power to Appoint Technical Advisors*, 54 VAND. L. REV. 547, 555 (2001).

¹³¹ Brennan, *supra* note 7, at 10; Brennan, *supra* note 3, at 523–30; Luneburg & Nordenberg, *supra* note 7, at 887.

¹³² Luneburg & Nordenberg, *supra* note 7, at 887. See generally Mark A. Nordenberg & William V. Luneburg, *Decisionmaking in Complex Federal Civil Cases: Two Alternatives to the Traditional Jury*, 65 JUDICATURE 420 (1982).

¹³³ Luneburg & Nordenberg, *supra* note 7, at 891–97.

¹³⁴ *Id.* at 891.

¹³⁵ *Id.* at 899.

¹³⁶ *Id.* at 922–41 (citing the Supreme Court's analysis in *Taylor v. Louisiana*, 419 U.S. 522 (1975) and *Duren v. Missouri*, 439 U.S. 357 (1979) for the proposition that more qualified jurors may be permissible in federal court); see also *Cobbs v. Robinson*, 528 F.2d 1331, 1336–37 (2d Cir. 1975) (holding that the intentional selection of jurors with above-average intelligence did not amount to a constitutional violation).

tasks in new contexts.¹³⁷ The need to develop a fair procedure to select a specially-qualified jury, and the limiting language of the 1968 Jury Service Act, however, provide practical limitations on the ability of the courts to implement this potential alternative.

Due to these limitations, Luneburg and Nordenberg offered a second alternative: the use of expert nonjury tribunals.¹³⁸ Based on the 1977 U.S. Supreme Court decision in *Atlas Roofing, Inc. v. Occupational Safety & Health Review Commission*,¹³⁹ the authors stated that cases deemed “unsuitable for jury determination,” may be heard “in a forum structured to provide the necessary ingredients for expeditious, informed, and rational adjudication.”¹⁴⁰ As a result, a court consisting of expert administrative judges may “contribute very significant ingredients to the decisionmaking process that, on balance, justify its use.”¹⁴¹ Therefore, the authors suggested creating a court with Kantrowitz-style panels arranged by subject matter and made up of non-Article III magistrates, who would accept cases on original jurisdiction or on transfer from other courts.¹⁴² Only with this structure would the court gain benefits—accuracy in decisions, efficiency, and consistency—that balance the weight of the loss of jury involvement.¹⁴³

Luneburg and Nordenberg clearly had been influenced by the functionalism of the Kantrowitz debate, and offered a new alternative in the federal courts that combined expertise and due process to create a new adjudicatory framework. While distinct from the Kantrowitz proposal, the Luneburg and Nordenberg proposal may have suffered by being so soon after the demise of Kantrowitz’s proposal, and the article failed to generate the mass debate and support of its predecessor.

By the end of the 1980’s, judicial innovators proposed a different type of science court structure. During this period, Troyen Brennan offered a distinct proposal, mixing elements of the expertise of the Kantrowitz and the Luneburg and Nordenberg proposals with the adjudicatory frameworks in place at the time.¹⁴⁴ In his articles from 1988 and 1989, Brennan proposed a subject-specific panel of experts to handle a particular class of complex cases: litigation involving hazardous substances.¹⁴⁵ Like his predecessors, Brennan recognized that generalized courts had serious limitations when it came to the most complex and difficult science.¹⁴⁶ As an alternative, he suggested that a regulatory body be given all hazardous substance issues, to dispense with them by both regulatory and adjudicatory functions.¹⁴⁷ Brennan suggested the adjudicatory panels could better

¹³⁷ Luneburg & Nordenberg, *supra* note 7, at 947.

¹³⁸ *Id.* at 950.

¹³⁹ *Atlas Roofing Co. v. Occupational Safety & Health Review Comm’n*, 430 U.S. 442, 450 (1977) (holding that where public rights are litigated, the Seventh Amendment does not prohibit their adjudication in an administrative forum without a jury); *see also infra* text accompanying note 275 (noting that the Supreme Court limited the scope of the *Atlas* holding in 1989).

¹⁴⁰ Luneburg & Nordenberg, *supra* note 7, at 951.

¹⁴¹ *Id.* at 988.

¹⁴² *See id.* at 996–99.

¹⁴³ *Id.* at 988.

¹⁴⁴ *See Brennan, supra* note 3, at 524–30; Brennan, *supra* note 7, at 10–20.

¹⁴⁵ Brennan, *supra* note 3, at 524–30.

¹⁴⁶ *Id.* at 493–501 (analyzing theoretical bases for weakness in handling toxicity evidence).

¹⁴⁷ *Id.* at 524–30.

handle the complexities of the scientific work, acting as a “science court” for uncertainties in the research of this field.¹⁴⁸ While not intended to replace tort systems, the panel would supplement the current system for better results.¹⁴⁹

Brennan’s proposal is illustrative of the subject-specific science panel movement, which has since then resulted in various calls for a science panel approach in a discrete area of law.¹⁵⁰ These proposals do not arise without challenges. Critics challenge both the argument that generalized systems need improvement by specialization, and that outcomes would improve with the formalization of expertise in a specialized panel.¹⁵¹ For now, the subject-specific panel proposals, like their predecessor the Lunenburg and Nordenberg proposal, have not received significant consideration for adoption within the federal system.

The 1980’s proposals—involving specialized bench trials or subject-specific panels to supplement litigation in generalized federal courts—show that the attraction of the incorporation of expertise into complex cases has not disappeared, even after the collapse of the Kantrowitz proposal. These proposals, however, have yet to receive the same degree of interest that Kantrowitz’s original proposal generated, and for now they remain untested.

III. WHY A SCIENCE COURT PROPOSAL NOW?

With the failure of the Kantrowitz proposal amid shifting political winds and critical responses, along with the failure of newer proposals to generate significant support, one could imagine that a science court proposal is unlikely to be well received, and even less likely to garner support. This Article concludes the opposite: this is the ideal time to consider the management of complex cases with a specialized court. Based on a series of changes in the law, new data concerning judicial handling of complex cases, and the examples provided by other specialized courts since the 1970’s, Congress should consider empowering specialized courts to handle specific categories of complex litigation.

A. Changes in the Law

Prior to the 1990’s—and during all of the significant debate over specialized courts—the judicial handling of complex expert testimony in science or other specialized

¹⁴⁸ *Id.* at 524–26 (discussing the benefits of a science court, including improvements in consistency, efficiency, and accuracy).

¹⁴⁹ *Id.* at 532 (“The proposal for a Science Panel is nonetheless neutral on the question of replacing or maintaining tort litigation of hazardous substances.”); *see also* Brennan, *supra* note 7, at 71 (“[T]he Board does not supplant the role of judges and juries.”).

¹⁵⁰ *See, e.g.*, Leroy L. Kondo, *Untangling the Tangled Web: Federal Court Reform Through Specialization for Internet Law and Other High Technology Cases*, 2002 UCLA J.L. & TECH. 1 (2002); Potter, *supra* note 3, at 256–61 (reviewing the utility of a science court in the context of Forest Management decisions).

¹⁵¹ *See, e.g.*, Carl F. Cranor, *Science Courts, Evidentiary Procedures and Mixed Science-Policy Decisions*, 4 RISK 113, 118–28 (1993).

fields involved application of the *Frye* standard.¹⁵² Once the *Daubert* standard replaced *Frye* for judicial analysis of expert testimony,¹⁵³ and the *Daubert* standard later received a highly deferential standard of review,¹⁵⁴ the judicial gatekeeping role, requiring direct review of the quality of science prior to admission, expanded greatly. In this era of judicial gatekeeping as opposed to the *Frye* era, the re-introduction of expertise through expert judges is more important than before. This section examines this rationale, prior to examining a structure for the court.¹⁵⁵

Under the *Frye* standard, the court analyzed whether proffered expert testimony had reached “general acceptance” in the relevant scientific community prior to admission at trial.¹⁵⁶ In doing so, the court weighed the value placed on the science **by the scientists**, and then measured whether the **scientists** themselves felt the theory met the admission standard. The analysis would be given deference on appellate review, as the district court had the opportunity to examine the support at the preliminary evidentiary admissibility level.¹⁵⁷ The *Frye* system “assures that those *most qualified* to assess the general validity of a scientific method will have the determinative voice.”¹⁵⁸

In 1993, the Supreme Court abandoned the *Frye* standard for admission of expert evidence, and adopted the standard set forth in Rule 702 of the Federal Rules of Evidence.¹⁵⁹ Under this standard, the trial judge must not only review the relevance of the proffered testimony—its “fit” to the facts of the case¹⁶⁰—but also the scientific reliability of the methodology employed.¹⁶¹ Scientific worthiness can be measured by a variety of tools, including by assessing the methodology, rate of error, peer review and publication, standards or controls, or general acceptance of the proffered evidence, but ultimately the judge must pass judgment on the quality of the science in question.¹⁶² The Supreme Court expressed confidence that judges would be able to handle this analysis.¹⁶³ Various courts also recognized, however, that *Daubert* had shifted the responsibility from “those most qualified to assess the general validity of a scientific method,”¹⁶⁴ such as the researchers and scientists themselves, and placed responsibility in the hands of the federal judiciary.¹⁶⁵

A second Supreme Court case decided soon after *Daubert* cemented the power of scientific review firmly within the hands of the federal district judges: *General Electric v.*

¹⁵² *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

¹⁵³ See generally *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993).

¹⁵⁴ See *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997).

¹⁵⁵ On the issues of the structure and procedure of the court, see *infra* Part IV.B.

¹⁵⁶ *Frye*, 293 F. at 1014.

¹⁵⁷ See, e.g., *United States v. Smith*, 869 F.2d 348, 353 (7th Cir. 1989) (examining the *Frye* analysis under the abuse of discretion standard); *United States v. Johnson*, 527 F.2d 1381, 1384 (D.C. Cir. 1976).

¹⁵⁸ *United States v. Addison*, 498 F.2d 741, 744 (D.C. Cir. 1974) (emphasis added).

¹⁵⁹ *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 589 (1993).

¹⁶⁰ *Id.* at 591.

¹⁶¹ *Id.* at 593.

¹⁶² *Id.* at 593–94.

¹⁶³ *Id.* at 593.

¹⁶⁴ *United States v. Addison*, 498 F.2d 741, 744 (D.C. Cir. 1974).

¹⁶⁵ *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 592–93 (1993).

Joiner.¹⁶⁶ In *Joiner*, the Supreme Court reviewed an Eleventh Circuit decision in which that appellate panel had applied a “particularly stringent standard of review” to the district court’s *Daubert* analysis.¹⁶⁷ The Supreme Court rejected this more searching standard—and *de novo* or other more stringent appellate review standards—and adopted the “abuse of discretion” standard.¹⁶⁸

The combination of *Daubert* and *Joiner* resulted in two significant effects: the removal of the authority on admissibility of science from the community of relevant scientists to the judiciary, and the expansion of judicial discretion to allow for wide-ranging approaches and analyses. The first ensures that judges will need to make decisions regarding the scientific value of complex, cutting-edge science; this is a daunting task for any generalist judge.¹⁶⁹ The second ensures a limited role for appellate courts reviewing district court evidentiary determinations,¹⁷⁰ and allows for the possibility of inconsistency in district court decisions, all within the range of discretion.¹⁷¹

In the new era of *Daubert* review, as opposed to the era of *Frye* review during which the science court debate occurred, the role of judge has risen to preeminence. For cases involving complex and cutting-edge science in the form of expert testimony review, the *Daubert* era mandates some additional knowledge, skills, or scientific background in order to allow judges to make accurate choices on admissibility of complex science. A specialized court makes more sense after *Daubert* and *Joiner* for this reason.

B. Research and Case Review

Due to the fact the *Daubert* era has placed such great responsibility in the hands of judges to review the quality of scientific research, it is fair to ask whether judges hold the tools to effectively evaluate complex science and technology. This concern is not new, as commentators openly questioned judicial skill with science during the era of Kantrowitz’s science court proposal.¹⁷² Judge Bazelon, Chief of the D.C. Circuit, stated that among judges, “I daresay that almost none have the knowledge and training to assess the merits of competing scientific arguments.”¹⁷³ He concluded that he and most other judges remain “technically illiterate.”¹⁷⁴ Yet the demands of *Daubert* mandate that the decision maker be capable of critically evaluating the strengths and weaknesses of the

¹⁶⁶ *Gen. Elec. v. Joiner*, 522 U.S. 136 (1997).

¹⁶⁷ *See Joiner v. Gen. Elec.*, 78 F.3d 524, 529 (11th Cir. 1996).

¹⁶⁸ *Joiner*, 522 U.S. at 143.

¹⁶⁹ *See Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311, 1315–16 (9th Cir. 1995) (Kozinski, J.) (stating that judges are in an “uncomfortable position” judging science, and the task is “more daunting” with cutting-edge science).

¹⁷⁰ Frank Tuerkheimer, *The Daubert Case and its Aftermath: a Shotgun Wedding of Technology and Law in the Supreme Court*, 51 SYRACUSE L. REV. 803, 825 (2001).

¹⁷¹ *See, e.g.*, David L. Faigman, *Appellate Review of Scientific Evidence Under Daubert and Joiner*, 48 HASTINGS L. J. 969, 974 (1997).

¹⁷² David L. Bazelon, *Coping with Technology Through the Legal Process*, 62 CORNELL L. REV. 817, 826 (1977).

¹⁷³ *Id.* at 822; *see also* Osborne, *supra* note 9, at 498, 524; Wesley, *supra* note 127, at 685.

¹⁷⁴ Bazelon, *supra* note 172, at 817.

complex research or science involved in a case.¹⁷⁵ In this era, Justice Stephen Breyer remains skeptical on the same issue, highlighting the fact that judges often lack fundamental skills in science.¹⁷⁶ By examining recent research on judicial expertise, and by evaluating judicial handling of complex cases, one may question the judiciary's ability to handle the most complex science and technology cases.

The empirical research in this area demonstrates that judges do often lack fundamental knowledge regarding science and statistics. Several recent studies have reviewed and tested the ability of judges to handle complex science and statistics.¹⁷⁷ These studies confirmed what Judge Bazelon suspected in 1977, and Justice Breyer affirmed in 1998: judges lack fundamental skills to assess complex scientific and statistical evidence.¹⁷⁸

Several studies demonstrate significant deficiencies in judicial capacity to evaluate basic scientific principles.¹⁷⁹ In her 2007 study, Dr. Hans studied a group of judges and tested both their background in science and their ability to handle DNA evidence.¹⁸⁰ In the study, Dr. Hans found that judges had received less education in science than a comparable jury pool subset of college-educated jurors.¹⁸¹ Compared to the standard jury pool of mixed college graduate and non-college graduate jurors, the judges were slightly but not statistically significantly higher in educational achievement in the area.¹⁸² When asked to review a video mock trial on DNA evidence and answer eleven questions applying that knowledge, the judges beat the score of the general jury pool on three answers, but scored lower than the subset of college-educated jurors on three questions as well.¹⁸³ The Hans study demonstrated a judicial deficit in background and application of science.

In a study conducted in 2001, Sophia Gatowski and her colleagues also researched judges and science.¹⁸⁴ In their study, the researchers surveyed judges on their background in science, and on their knowledge of basic scientific principles.¹⁸⁵ The judges surveyed responded that they had training in specific areas of science, but lacked training in general methods and theories of science.¹⁸⁶ Judges themselves questioned whether their background was sufficient.¹⁸⁷ When asked to apply their knowledge, the

¹⁷⁵ Thibaut & Walker, *supra* note 57, at 564.

¹⁷⁶ Stephen Breyer, *Introduction* to FED. JUDICIAL CTR., REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 1, 4 (2d ed., 2000).

¹⁷⁷ Gatowski et al., *supra* note 10, at 433; Hans, *supra* note 10, at 19; *see also* discussion *infra* notes 190–93 and accompanying text.

¹⁷⁸ *See supra* text accompanying notes 173–74; *see also* Bazelon, *supra* note 172, at 817; Osborne, *supra* note 9, at 498, 524; Wesley, *supra* note 127, at 685.

¹⁷⁹ For a more detailed examination of these studies, *see* Jurs, *supra* note 9, at 70–75.

¹⁸⁰ Hans, *supra* note 10, at 30, 36–39.

¹⁸¹ *Id.* at 30.

¹⁸² *Id.*

¹⁸³ *Id.* at 36–38.

¹⁸⁴ Gatowski et al., *supra* note 10, at 433.

¹⁸⁵ *See id.*

¹⁸⁶ *Id.* at 442.

¹⁸⁷ *Id.*

judges could correctly define some scientific principles but only a small percentage could define the basic scientific principles of “error rate” and “falsifiability.”¹⁸⁸ The Gatowski study again shows significant deficits in judicial capacity to analyze scientific principles.¹⁸⁹

In addition to the empirical research on judges and scientific principles, assessment of judges and complex statistical evidence shows similar problems. In his analysis of statistical evidence in civil rights litigation, Richard Lempert concluded judges were poorly trained to critically examine and evaluate mathematical data.¹⁹⁰ In her review of studies of statistical analysis by judges, jurors, and attorneys, Jennifer Robbennolt recognized that legal actors miss significant statistical errors in evidence, and that a “basic grounding in the methods of social science is essential to a nuanced understanding of the implications of [a study’s] methodological choices.”¹⁹¹ Because judges lack statistical training and come from backgrounds with less substantial math or science training, Robbennolt concluded, “[A]ttorneys, judges, and jurors have difficulty assessing empirical research methodology and are not sensitive to differences in methodological quality.”¹⁹² Other researchers and commentators agree with this conclusion.¹⁹³ Considering the essential nature of statistics in modern litigation,¹⁹⁴ this research displays particularly alarming weaknesses of the statistical skills of the judiciary.

The combined effect of the analysis of judicial scientific and statistical capacity demonstrates that judges may lack the background and skills necessary to perform their *Daubert* gatekeeping function.

In addition to the research, though, the case law provides an additional means to assess the capacities of judges in applying knowledge. In the high tech case law, judicial handling of complexities inherent in internet and technology cases shows deficiencies in

¹⁸⁸ *Id.* at 444, 447.

¹⁸⁹ While the Gatowski study, *supra* note 10, at 439, studied solely state court judges’ handling of scientific issues, a more recent study has shown that state and federal court judges experience similar difficulties with complex scientific evidence. Shirley Dobbin, Sophia Gatowski et al., *Federal and State Trial Judges on the Proffer and Presentation of Expert Evidence*, 28 JUST. SYS. J. 1, 12–13 (2007).

¹⁹⁰ Richard Lempert, *Befuddled Judges: Statistical Evidence in Title VII Cases*, in LEGACIES OF THE 1964 CIVIL RIGHTS ACT 263, 278 (Bernard Grofman, ed., 2000).

¹⁹¹ Jennifer K. Robbennolt, *Evaluating Empirical Research Methods: Using Empirical Research in Law and Policy*, 81 NEB. L. REV. 777, 797 (2002).

¹⁹² *Id.* at 796.

¹⁹³ See Samuel Lindsey, Ralph Hertwig & Gerd Gigerenzer, *Communicating Statistical DNA Evidence*, 43 JURIMETRICS J. 147, 150, 158–60 (2003) (studying the success of interpreting forensic DNA); Michael Heise, *Equal Educational Opportunity by the Numbers: The Warren Court’s Empirical Legacy*, 59 WASH. & LEE L. REV. 1309, 1339–40 (2002) (reviewing educational opportunity cases, and noting that judges lack basic statistical training and that judges recognize this as a weakness) (citing *Craig v. Boren*, 429 U.S. 190, 204 (1976) (“It is unrealistic to expect either members of the judiciary or state officials to be well versed in the rigors of experimental or statistical technique.”)); see also DAVID L. FAIGMAN, *LEGAL ALCHEMY: THE USE AND MISUSE OF SCIENCE IN THE LAW* 53–54 (1999) (describing background of judges lacking science and math training).

¹⁹⁴ See Breyer, *supra* note 176, at 2 (citing *Hunt v. Cromartie*, 526 U.S. 541 (1999); *Dep’t of Commerce v. U.S. House of Rep’s*, 525 U.S. 316 (1999)).

judicial knowledge on the subjects.¹⁹⁵ Courts handling complex environmental disputes have experienced difficulty with the complex technical and scientific material inherent to those disputes.¹⁹⁶ Judicial analysis of the scientific basis for forensic science recently received critical attention, from a highly-publicized National Academy of Sciences and National Research Council report.¹⁹⁷ Finally, judicial handling of complex epidemiologic evidence since *Daubert* shows that the judiciary has difficulty with the material.¹⁹⁸

Review of the studies of empirical research on judicial capacity and case law interpreting complex science demonstrates that while judges have been granted gatekeeping powers with wide discretion by *Daubert* and *Joiner*, they may not have the technical background and skills to succeed at their assignment.

C. The Success of Other Specialized Courts Since 1976

Since the mid-1970's, several specialized court models have been successfully employed in a variety of nuanced fields.¹⁹⁹ Specialized courts exist because of the perception that they can more consistently, efficiently, and accurately handle complexities inherent in a particular field, and attract litigants interested in a venue more familiar with their nuanced dispute issues.

1. Business

Specialized business courts date to the early days of the American Republic but

¹⁹⁵ Kondo, *supra* note 150, at nn.13–14 (citing *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980); *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998)).

¹⁹⁶ Whitney, *supra* note 43, at 477–82, 500; *see also* Potter, *supra* note 3, at 251–59 (describing the reluctance of courts to address scientific issues on the merits).

¹⁹⁷ COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIS. CMTY., NAT'L RESEARCH COUNCIL, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 85–110 (2009) (reviewing judicial problems in gatekeeping role with forensic evidence).

¹⁹⁸ Jurs, *supra* note 9, at 54–57 (reviewing the inconsistent handling of, and critical review of, epidemiologic analysis in judicial analysis since *Daubert*). The difficulty may be compounded by the limited exposure judges have had to the issue of epidemiological evidence, as a recent study demonstrated that 72.9% of trial judges had no exposure to epidemiological evidence in court, and an additional 14.5% had seen it only once. James T. Richardson et al., *Judges and Epidemiological Evidence*, 87 JUDICATURE 38, 38 (2003); *see also* Brennan, *supra* note 3, at 491–501 (reviewing the judicial handling of complex hazardous substance cases in the *Frye* era).

¹⁹⁹ This is not to say all specialized courts have been started since 1975 or so. Perhaps the most famous, the Delaware Court of Chancery, predates 1800. *See* William T. Quillen & Michael Hanrahan, *A Short History of the Delaware Court of Chancery – 1792-1992*, in BICENTENNIAL COMMEMORATION COMMITTEE, COURT OF CHANCERY OF THE STATE OF DELAWARE 1792-1992 (1993); *see also* discussion *infra* Part III.C.1.

Other federal specialized courts also date to prior to 1975. For example, the U.S. Tax Court developed over the first half of the 20th Century and has been deemed reasonably successful. HAROLD DUBROFF, *THE UNITED STATES TAX COURT: AN HISTORICAL ANALYSIS* (1979); *see also* Whitney, *supra* note 43, at 477. The U.S. Court of Federal Claims dates to 1855. WILSON COWEN, PHILIP NICHOLAS, JR., & MARION T. BENNETT, *THE UNITED STATES COURT OF CLAIMS: A HISTORY, PT. II ORIGIN, DEVELOPMENT, JURISDICTION, 1855-1978* 13–25 (1978). The U.S. Court of International Trade dates its origin to the creation of the Court of Customs in 1926. Randall R. Rader, *Specialized Courts: The Legislative Response*, 40 AM. U. L. REV. 1003, 1011 (1991).

only recently have been widely used in a variety of states.

The Delaware Court of Chancery has provided a specialized court for business dispute resolution since 1792.²⁰⁰ Sitting as a court of equity without a jury, the Court of Chancery adjudicates commercial disputes and, since 2003, technology disputes.²⁰¹ The expertise shown by the court results in a majority of decisions never being appealed, and it has greatly expanded the influence of this state court in the development of national corporate law.²⁰² As a result, the Delaware court has become a preeminent forum for corporate litigation, with a reputation unmatched in any other court in the land, and this leads to the court addressing many of the most important recent corporate cases.²⁰³ The Court of Chancery is a major factor in Delaware being “the corporate leader for the country.”²⁰⁴ The dominance of the State of Delaware has been long established in corporate law, predating the specialized or science court debates of the 1970’s.

Other states have recognized the benefits Delaware reaps from its specialized court, and have recently attempted to replicate the specialized business court model. In 1993, Illinois and New York developed their own specialized business courts, and North Carolina did so in 1995; since then, many others have followed.²⁰⁵ The success of these courts is at least in part due to their specialized expertise in the field, and also the consistency of decisions and overall systematic docket efficiency.²⁰⁶ The expansion of the specialized business court model since 1990 is a triumph of the ideal of functionalism called for by the science court proponents in the 1970’s and early 1980’s.²⁰⁷ It provides one example of the success of a specialized docket for a science court to emulate.

2. Bankruptcy

While the business court model saw its greatest expansion and success after the science court debates of 1976, it existed well before that date. The specialized federal bankruptcy courts, however, were formed in 1978 and have only been evaluated since

²⁰⁰ Nees, *supra* note 11, at 480 (describing the Court of Chancery as “the ‘godfather’ of modern business courts”).

²⁰¹ Randy J. Holland, *Delaware’s Business Courts: Litigation Leadership*, 34 J. CORP. L. 771, 773–74 (2009).

²⁰² *Id.* at 773; William H. Rehnquist, *The Prominence of the Delaware Court of Chancery in the State-Federal Joint Venture of Providing Justice*, 48 BUS. LAW. 351, 354 (1992).

²⁰³ Faith Stevelman, *Regulatory Competition, Choice of Forum, and Delaware’s Stake in Corporate Law*, 34 DEL. J. CORP. L. 57, 72 (2009) (stating that many of the most important recent corporate cases have been heard before the Court of Chancery); Yan Leychksi, *Of Fire Ants and Claim Construction: An Empirical Study of the Meteoric Rise of the Eastern District of Texas as a Preeminent Forum for Patent Litigation*, 9 YALE J. L. & TECH. 193, 229 (2007) (stating that the Court of Chancery “has become the preeminent forum for corporate litigation”); Robert B. Thompson & Randall S. Thomas, *The New Look of Shareholder Litigation: Acquisition-Oriented Shareholder Actions*, 57 VAND. L. REV. 133, 165 (2004).

²⁰⁴ Nees, *supra* note 11, at 481 (citing HARRIET SMITH WINDSOR, DEL. DEP’T OF STATE, 2006 ANNUAL REPORT 1 (2007)).

²⁰⁵ *Id.* (noting the existence of seventeen states with a specialized business docket); *see also, e.g.*, Lee Applebaum, *The “New” Business Courts: Responding to Modern Business and Commercial Disputes*, BUS. L. TODAY, March/April 2008, at 13, 14–17.

²⁰⁶ Wallace B. Jefferson, *The State of the Judiciary in Texas*, 70 TEX. B. J. 314, 316 (2007).

²⁰⁷ Luneburg & Nordenberg, *supra* note 7, at 1006.

then.²⁰⁸ As a result, the bankruptcy courts present a new example of specialized court success not in existence at the time of the science court debate.

Prior to 1978, authority to decide bankruptcy disputes resided within federal district courts, state courts, and the system of bankruptcy “referees” established by the 1898 Bankruptcy Act.²⁰⁹ Then, in 1978, Congress replaced this overlapping system of jurisdictional and procedural problems with a single unified court system for adjudication of bankruptcy issues: the U.S. Bankruptcy Court.²¹⁰ Not only do the bankruptcy courts have jurisdiction of disputes under Title 11 of the U.S. Code—the Bankruptcy Code—but they also have jurisdiction over all disputes “arising in or related to” a bankruptcy case.²¹¹ After 1978, the bankruptcy system saw procedural changes pursuant to Supreme Court rulings and Congressional Acts,²¹² but the essentially unified nature of the system and the specialized nature of the judiciary remained intact.²¹³

The new specialized bankruptcy system has been a success by all measures. The system efficiently handles a large docket of highly complex litigation.²¹⁴ It has beneficial effects on the way businesses operate²¹⁵ and it provides a model for specialized courts in other subject matter areas.²¹⁶ The Federal Courts Study Committee, a prominent formal committee reviewing the federal judicial system, characterized the bankruptcy system as a major successful example of a specialized court.²¹⁷ Other commentators concur with

²⁰⁸ The Bankruptcy Act of 1898 established referees for bankruptcy cases in federal district court, but not until 1978 did the jurisdiction become unified within the specialized courts. *See infra* notes 209–15 and accompanying text; The Bankruptcy Reform Act of 1978, Pub. L. No. 95-598, 92 Stat. 2549 (1978) (codified as amended primarily at 11 U.S.C. §§ 101–1532 (2006)) [hereinafter 1978 Bankruptcy Act].

²⁰⁹ Lloyd D. George, *From Orphan to Maturity: The Development of the Bankruptcy System During L. Ralph Mechem’s Tenure as Director of the Administrative Office of the United States Courts*, 44 AM. U. L. REV. 1491, 1492 (1995).

²¹⁰ *Id.* at 1493–94 (citing the 1978 Bankruptcy Act § 1471(b)).

²¹¹ 1978 Bankruptcy Act § 1471(b), (c); *see also* Christopher F. Carlton, *Greasing the Squeaky Wheels of Justice: Designing the Bankruptcy Courts of the Twenty-First Century*, 14 BYU J. PUB. L. 37 (1999) (reviewing the same provision).

²¹² George, *supra* note 209, at 1494–98 (reviewing the decision in *N. Pipeline Constr. Co. v. Marathon Pipe Line Co.*, 458 U.S. 50 (1982), the Bankruptcy Amendments and Federal Judgeship Act of 1984, Pub. L. No. 98-353, 98 Stat. 333 (1984), and the Bankruptcy Reform Act of 1994, Pub. L. No. 103-394, 108 Stat. 4106 (1994)).

²¹³ *Id.*

²¹⁴ *Id.* at 1501.

²¹⁵ *See, e.g.*, Elizabeth Warren & Jay Lawrence Westbrook, *The Success of Chapter 11: A Challenge to the Critics*, 107 MICH. L. REV. 603, 640 (2009).

²¹⁶ *See, e.g.*, Kimberly Breedon, Comment and Casenote, *The Reach of Raich: Implications for Legislative Amendments and Judicial Interpretations of the Clean Water Act*, 74 U. CIN. L. REV. 1441, 1476 (2006) (stating that a court system like the bankruptcy model could help adjudication of Clean Water Act disputes).

²¹⁷ FEDERAL COURTS STUDY COMMITTEE, *supra* note 11, at 74. The committee had been created by Congress in 1988, Judicial Improvements and Access to Justice Act of 1988, Pub. L. No. 100-702, 102 Stat. 46 (1988), and consisted of 15 members appointed by the Chief Justice, including federal and state judges, practicing attorneys, and members of Congress. *See, e.g.*, Jonathan R. Siegel, *What Statutory Drafting Errors Teach Us About Statutory Interpretation*, 69 GEO. WASH. L. REV. 309, 341 (2001) (describing the Federal Courts Study Committee); Carl Tobias, *A Federal Appellate System for the Twenty-First Century*, 74 WASH. L. REV. 275, 279 (1999).

this conclusion.²¹⁸

3. Court of Appeals for the Federal Circuit

The Court of Appeals for the Federal Circuit, with its consolidated jurisdiction of appellate review of specialized litigation cases, forms a third example of a successful specialized court, again created and debated solely since the science court debate of 1976.²¹⁹ While the court hears appeals on a variety of other subjects such as trademarks, customs, or government contracts, “[its] primary claim to technical expertise [is in] the patent area.”²²⁰ As a result of its expertise in patent law, the Court provides a useful example of specialization on the appellate level.²²¹

Rochelle Dreyfuss analyzed the effect of the 1982 restructuring of patent jurisdiction on the quality of results in her comprehensive study of the patent law from the Federal Circuit.²²² In this study, Dreyfuss reviewed the first five years of the court’s operation, and assessed the court’s accuracy, precision, coherence, and efficiency.²²³ After reviewing all of these areas, the study concluded that the Federal Circuit has made patent law in the U.S. “more uniform, easier to apply, and more responsive to national interests.”²²⁴ The benefits include more accuracy, precision,²²⁵ and coherence in the body of patent law.²²⁶ The court does suffer from jurisdictional weaknesses in its design, indicates Dreyfuss.²²⁷ The overall portrait, however, is an “optimistic view,” since the

²¹⁸ See, e.g., John J. Gibbons, *The Quality of Judges Is What Counts in the End*, 61 BROOK. L. REV. 45, 47 (1995) (stating that bankruptcy courts have been “remarkably successful”); Emily Chow, Note, *Health Courts: An Extreme Makeover of Medical Malpractice With Potentially Fatal Complications*, 79 YALE J. HEALTH POL’Y L. & ETHICS 387, 398 (2007) (stating that the legitimacy of specialized courts derives from the success of specialized courts like bankruptcy courts).

²¹⁹ While the predecessor court to the Court of Appeals for the Federal Circuit dates to 1929, Congress did not vest exclusive jurisdiction for patent appeals in the Federal Circuit until 1982. The Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 25 (1982); see also DiLello, *supra* note 12, at 490–91.

²²⁰ Dreyfuss, *supra* note 3, at 4–5. One commentator notes that the difference between the Court of Appeals for the Federal Circuit and other specialized courts is that the Appellate Court has specialized subject matter jurisdiction, but not necessarily expert judges like other specialized courts. DiLello, *supra* note 12, at 492 n.144 (citing S. Jay Plager, *The United States Courts of Appeals, The Federal Circuit, and the Non-Regional Subject Matter Concept: Reflections on the Search for a Model*, 39 AM. U. L. REV. 853, 853 n.1, 858–60 (1990); Dreyfuss, *supra* note 3, at 4–5).

²²¹ Dreyfuss, *supra* note 3, at 4–5. There has recently been a bipartisan attempt to introduce specialized patent judges at the trial court level as well, which has made it past the Senate Judiciary Committee. See The Patent Reform Act of 2009, S. 515, H.R. 1260, 111th Cong. (2009). The Act has been reported by committee to the Senate, but has not been placed on the agenda. S. REP. NO. 111–19 (2009); see also Donna M. Glitter, *Should the United States Designate Specialist Patent Trial Judges? An Empirical Analysis of H.R. 628 in Light of the English Experience and the Work of Professor Moore*, 10 COLUM. SCI. & TECH. L. REV. 169 (2009).

²²² Dreyfuss, *supra* note 3, at 1.

²²³ *Id.* at 74.

²²⁴ *Id.*

²²⁵ *Id.* at 8 (defining precision as the extent of uniformity of results between courts).

²²⁶ *Id.* at 24.

²²⁷ *Id.* at 30–46; see also *infra* note 244 and accompanying text.

court is “functioning well” within the federal system.²²⁸

Since the end of the initial science court debate, three major examples of specialized courts in the judicial system—business courts, bankruptcy courts, and the Federal Circuit—have been established, and been shown to work effectively.

D. Conclusion

Considering the changes in the law and other factors since the 1970’s, a science court is ripe for reconsideration. The law has expanded judicial review and analysis of the quality of science and it has granted significant judicial discretion for those reviews. Coupled with that discretion, recent empirical studies show judges may lack skills to properly assess science and statistics. In addition, examples of subject-specific courts handling particularized dockets of complex subject material demonstrate the benefits of specialization. Without specialization, courts risk error in their review of increasingly complex science. These errors can have severe effects on litigants, from the potential for uncompensated injuries when plaintiffs are wrongly denied recompense to the stifling of innovation when injuries are wrongly compensated.²²⁹ To succeed in maintaining the correct balance, it is time to “search for law that reflects an understanding of the relevant underlying scientific art,”²³⁰ and specialization is an appropriate tool for that end result.

IV. PROPOSED STRUCTURE FOR AN ARTICLE III COURT OF SCIENTIFIC JURISDICTION

Having reviewed the need for a specialized court in the field of complex science, the next step is to sensibly design a court that maximizes the benefits of that specialization. In this section, this Article will discuss the design of a federal Court of Scientific Jurisdiction, beginning with the objectives for the court, followed by its jurisdiction, structure, and procedure. The experience of the Kantrowitz science court proposal guides these efforts. Finally, the discussion will review the benefits to be achieved by implementation of this proposal.

A. Principles for the Court

While perhaps designed to address different disputes than the Kantrowitz science court, the exact same goals would be served by the specialization of scientific knowledge in an Article III science court. Each of the following three objectives is an important consideration for the Court of Scientific Jurisdiction.

First, the court must be designed to purify the scientific inquiry occurring within its cases by focusing on the quality of scientific research, data, or opinions submitted by

²²⁸ Dreyfuss, *supra* note 3, at 65.

²²⁹ Stephen Breyer, *The Interdependence of Science and Law*, 82 JUDICATURE 24, 25 (1998) (explaining the costs associated with inaccurate results in scientific cases).

²³⁰ *Id.*

litigants.²³¹ The goal is to have a finalized statement of the quality of the science presented by experts, the current state of knowledge in the field, and the extent to which the expert opinions are supported or rebuffed by the overall state of knowledge.²³² In doing so, the court will ensure “defensible, credible, technical bases” for each opinion, increasing the accuracy and precision of the results.²³³

Second, the CSJ should capture scientific expertise within the judiciary selected for service, to serve the goals of accuracy, consistency, and precision.²³⁴ Accordingly, the expertise of the judges is the central feature of the CSJ proposal.²³⁵

Finally, the court must be structured to minimize the role of outside influences on the quality of decision making regarding science.²³⁶ Kantrowitz worried about the effect of political influences on the quality of scientific decisions.²³⁷ While political choices are not the usual contaminant of judicial analysis, the undue influence within the court system that affects analysis of science in court is the adversarialism of the proceeding.²³⁸ Reduction in adversarialism will be a necessary cost to increase accuracy and efficiency of the CSJ outcomes.

The CSJ must be designed to serve these goals, to achieve the greatest chance of success in efficiency, accuracy, consistency, and other benefits of the proposal. Learning from the Kantrowitz proposal provides useful insight for the design of the CSJ processes.

B. Design of the Court

Creating the right design for the court involves the delicate balancing of maximizing the benefits of specialization with minimizing the negative consequences of the changes.

1. Jurisdiction

The jurisdiction of the CSJ is perhaps the most critical element to its success, and the most likely pitfall. Too much jurisdiction and the court will collapse under the docket weight and be unable to function effectively. Too little jurisdiction and the court will fail

²³¹ See discussion *supra* Part II.B.1; see also *supra* text accompanying notes 55–56.

²³² See *infra* Part IV.B.3.

²³³ Task Force, *supra* note 56, at 653.

²³⁴ See discussion *supra* Part II.B.1; see also *supra* text accompanying notes 57–60.

²³⁵ See *infra* Part IV.B.2.

²³⁶ See discussion *supra* Part II.B.1 and text accompanying notes 61–64.

²³⁷ Kantrowitz, *supra* note 58, at 62; Kantrowitz, *supra* note 2, at 506.

²³⁸ Franklin Strier, *Making Jury Trials More Truthful*, 30 U.C. DAVIS L. REV. 95, 113–14 (1996) (“The more complex and technical the subject matter, the less well suited the adversary system is to full and accurate communication of the findings. . . . But the most basic problem is that adversarial procedure assigns sole responsibility for conducting the inquiry to the functionaries who may be least interested in exposing the relevant scientific evidence.”); see *infra* Part IV.B.2 (noting that the expertise of the judiciary helps determine scientific merit of proffered testimony); see also *infra* Part IV.C.2 (stating that judicial expertise incorporates outside information, if deemed necessary to adjudication of disputes).

to achieve the “critical mass” of expertise and cases necessary to achieve success.²³⁹

As a federal court, the CSJ must have diversity of parties to achieve jurisdiction.²⁴⁰ The subject matter jurisdiction must therefore be tailored to the reasons for specialization.²⁴¹ One of the primary reasons for the CSJ is the increased judicial analysis of the quality of proffered science—the “gatekeeping”—under *Daubert* and *Joiner*.²⁴² As a result, the jurisdiction of the CSJ must include those cases most likely to involve complex scientific, technological, or other expert issues.²⁴³ Finally, the weakness of several specialized courts in the federal system has been identified by many scholars as too little jurisdiction, not too much.²⁴⁴ The court must be limited to a subset of cases truly requiring expertise, however, lest it be overrun by collecting every diversity case involving experts.

Considering and integrating these different strands of thought is a delicate balancing process.²⁴⁵ In a previous article, this author offered a potential jurisdictional framework, involving minimal diversity plus scientific issues of significant complexity.²⁴⁶ Expanding on those thoughts, this Article suggests jurisdiction be shaped by consideration of the following factors:

- Whether the case has diversity of citizenship, modeled on 28 U.S.C. § 1332(d);²⁴⁷
- Whether the determination of admissibility of evidence under Federal Rule of Evidence 702 and *Daubert* involves complex scientific or technical information and is directly related to a claim “at issue” in the complaint or answer;²⁴⁸

²³⁹ See *infra* note 244 and accompanying text.

²⁴⁰ Jurs, *supra* note 9, at 92.

²⁴¹ Dreyfuss, *supra* note 3, at 74.

²⁴² See discussion *supra* Part III.A.

²⁴³ Essentially, CSJ jurisdiction should include these cases because they make up the proper subset of cases with *Daubert* review under FED. R. EVID. 702.

²⁴⁴ Dreyfuss, *supra* note 3, at 34–37, 54–57 (discussing Federal Circuit problems with narrow interpretation of jurisdiction and arguing for wider jurisdiction on patent issues); Whitney, *supra* note 43, at 486–87 (stating that the U.S. Tax Court suffers from design without exclusive jurisdiction, and that the proposed environmental court must have exclusive jurisdiction).

²⁴⁵ See, e.g., Whitney, *supra* note 60, at 38.

²⁴⁶ Jurs, *supra* note 9, at 48 n.249, 54 nn.265–66.

²⁴⁷ At its outer constitutional limit, applied by Congress to class action lawsuits, diversity jurisdiction permits the federal court to exercise jurisdiction over lawsuits where any plaintiff and any defendant are from different States or a State and foreign jurisdiction. U.S. CONST. art. III, § 2, cl. 1; 28 U.S.C. § 1332(a)(1), (4), 1332(d)(2) (2006); see also The Class Action Fairness Act of 2005, Pub. L. No. 109-2, § 2, 119 Stat. 4, 4–5 (2005) (stating that a purpose of the Act is to increase federal courts role in adjudication of class action lawsuits under diversity jurisdiction, due to “abuses” of the system in state courts). The CSJ should incorporate this minimum diversity requirement. The requirement permits the court’s exercise of jurisdiction on most cases of significant scientific content, so long as diversity meets the *minimal* federal requirements. This is the sole consideration in the list that is constitutionally mandatory. All other factors may be considered alone, or in combination with other factors.

²⁴⁸ This doctrinal factor requires that courts would prevent the CSJ from overstepping the bounds of its subject matter jurisdiction, by restricting exercise of jurisdiction to the extent a case “arises under” the

- Whether the determination of contested *Daubert* issues would be “substantially assisted” by judicial expertise in the scientific or technical field at issue in the case;²⁴⁹
- Whether the scientific or technical information is very likely to be heard by other courts in unrelated cases;²⁵⁰
- Whether the use of existing procedures is unlikely to inform the judge on the expert claims “at issue” in the case;²⁵¹ and
- Whether the case involves “new or novel” scientific or technical controversies.²⁵²

By applying these considerations, the jurisdiction of the CSJ would meet constitutional requirements and balance competing values. It would grant exclusive trial jurisdiction to the subset of expert cases in which new or novel scientific evidence is presented, cases likely to reappear in other courts, cases where judicial expertise offers substantial assistance, and cases where existing structures may be inadequate. Other cases—those less likely to involve complexity or new science, or those that can be resolved with existing methods—would remain outside the jurisdictional grant of the CSJ. This balancing would allow expert judges to handle those cases where expertise is most essential: those most likely to not have been thoroughly evaluated in the past, and those most likely to be used as precedent by other courts in the future.

2. Structure

To handle this subset of complex, new, and technologically- or scientifically-

scientific matter described in the initial complaint. A similar factor, “whether the action [described in a well-pleaded complaint] arises under federal patent law,” currently restricts the Federal Circuit’s jurisdiction. *Holmes Group, Inc., v. Vornado Air Circulation Sys., Inc.*, 535 U.S. 826, 829 (2002) (describing the patent jurisdiction of the Federal Circuit). *See also* Sarang Vijay Damle, Note, *Specialize the Judge, Not the Court: A Lesson From the German Constitutional Court*, 91 VA. L. REV. 1267, 1282–83 (2005) (reviewing the effect of *Holmes* on the Federal Circuit).

²⁴⁹ This would limit the number of expert cases to those that require a higher level of review.

²⁵⁰ One well-reasoned opinion from a federal judge can provide significant leadership for others reviewing the same field. *See* Wendy E. Wagner, *Ethyl: Bridging the Science-Law Divide*, 74 TEX. L. REV. 1291, 1293 (1996).

²⁵¹ While difficult to assess in the initial stages, extending CSJ jurisdiction to these cases (where existing procedures are not adequate to inform the judge on the expert claims at issue) clearly extends CSJ jurisdiction to a limited number of cases, as only those requiring a higher level of review would meet the standard.

²⁵² In some states that still apply the *Frye* standard, “pure opinion,” as opposed to a deduction based on “a new or novel” scientific principal, formula, or procedure developed by others,” does not need to meet “general acceptance” prior to admission. *See, e.g.*, Joseph Sanders, *The Merits of the Paternalistic Justification for Restrictions on the Admissibility of Expert Evidence*, 33 SETON HALL L. REV. 881, 882 (2003) (citing *Kuhn v. Sandoz Pharms. Corp.*, 14 P.3d 1170, 1179 (Kan. 2000); *Florida Power & Light Co. v. Tursi*, 729 So. 2d 995, 997 (Fla. Dist. Ct. App. 1999)). When determining a science court’s jurisdiction, the critical component of novelty would be the lack of prior judicial review and the resulting likelihood the case would serve as a guidepost for future judges and parties.

advanced cases effectively, the CSJ's structure would need a diversity of expertise among its trial judges, a method of determining case assignment, and a plan for appellate-level review.

Expertise is the central benefit of the CSJ proposal. The CSJ would select judges with significant experience²⁵³ in diverse complex fields—the natural sciences, applied science, technology, and engineering, to name a few—and then assign them cases according to their fields of experience. This structure would provide each case with a “decisionmaker . . . who is fully capable of evaluating the particular claims in dispute.”²⁵⁴ Assignment of cases directly related to a judge's expertise is, of course, ideal and should be used when possible. The benefits of this assignment structure include the increased ability to recognize the scientific merit in proffered testimony,²⁵⁵ greater capacity to handle cases quickly due to the decrease in need for case-by-case research,²⁵⁶ and more immediate recognition of the limitations of science offered by the parties.²⁵⁷ Expertise could be measured by a judge's background education in the field²⁵⁸ or by the development of a skills-based assessment method.²⁵⁹

One aspect of the assignment of cases received significant attention during the Kantrowitz science court debate, and that discussion should be considered when planning the CSJ. Kantrowitz recognized that usually, when assigning decision-makers to particular matters, “one must choose between those who have gone deeply into the subjects under discussion and, accordingly, will have preconceived ideas about what the outcome should be, and those who are perhaps unprejudiced but relatively uninformed”²⁶⁰ To balance the need for expertise against the problem of preconceived notions when adjudicating issues in a particular field, Kantrowitz suggested selecting judges from experts in “neighboring fields.”²⁶¹ While the definition of “neighboring fields” requires further elaboration and discussion, applying this suggestion should ensure impartiality along with expertise.²⁶² The general proposition that “the [scientist] will provide a more educated perspective than the nonscientist judge” when reviewing scientific determinations,²⁶³ even when operating outside his or her specific

²⁵³ Regarding what constitutes “experience,” see *infra* text accompanying notes 258–59.

²⁵⁴ Thibaut & Walker, *supra* note 57, at 564.

²⁵⁵ See Lawrence Baum, *Probing the Effects of Judicial Specialization*, 58 DUKE L.J. 1667, 1676 (2009); Damle, *supra* note 248, at 1277; Martin, *supra* note 58, at 492.

²⁵⁶ See DiLello, *supra* note 12, at 482.

²⁵⁷ See Martin, *supra* note 58, at 492; Potter, *supra* note 3, at 259.

²⁵⁸ This factor is intended to counteract the deficiencies in scientific background shown among generalist judges by empirical study in Gatowski et al., *supra* note 10, at 442; and in Hans, *supra* note 10, at 30. See also Lempert, *supra* note 190, at 278. Education should counteract these deficiencies. See generally discussion *supra* Part III.B.

²⁵⁹ Studies have also found deficiencies in skill application among generalist judges. Gatowski et al., *supra* note 10, at 444, 447 (specifically discussing comprehension of falsifiability and error rate); Hans, *supra* note 10, at 36–38; (studying judge and jury understanding and application of mtDNA evidence); Lempert, *supra* note 190, at 278 (considering judicial treatment of statistical precedents). See generally discussion *supra* Part III.B.

²⁶⁰ Kantrowitz, *supra* note 1, at 763 (discussing the selection of scientific advisory committees).

²⁶¹ Kantrowitz, *supra* note 58, at 64.

²⁶² Martin, *supra* note 58, at 491–92.

²⁶³ *Id.* at 492.

field, is relatively less controversial. These considerations may be involved in the case assignment process of the CSJ.

The permanence of the CSJ, and the resulting responsibility its judges would assume, would be one of the major side benefits of this structure. Having a permanent court would avoid one of the major weaknesses of the Kantrowitz proposal: the lack of accountability for ad hoc panels. Kantrowitz proposed that each science court decision be published, making the author accountable for the work.²⁶⁴ While this procedure would have provided some external accountability in the scientific community, critics have argued that other aspects of these ad hoc proceedings would still discredit decisions.²⁶⁵ For the CSJ, however, the permanent structure of the court would provide for both internal legal accountability (by appellate review)²⁶⁶ and external scientific accountability (by providing the external scientific community an opportunity to review the opinions for scientific accuracy).²⁶⁷

Finally, the assignment of cases to the CSJ and to specific judges based on expertise would not violate random case assignment rules or law. Case assignments are not required to be random, by statute or otherwise, and a non-random assignment may be appropriate in consideration of other interests.²⁶⁸

3. Procedure

With the selection of cases qualifying to be heard at the CSJ being determined by a jurisdictional statute, and the case selection process largely established by the court's structure, the third and final leg of the CSJ stool is the procedure by which the specialist judges will make the necessary determinations on the complex cases assigned to them.

²⁶⁴ Kantrowitz, *supra* note 1, at 764; *cf.* Task Force, *supra* note 56, at 655 (noting that the decisions of a science court might exert great influence on scientific study, stimulating research in certain new fields, and that the judges' decisions should be evaluated for potential bias).

²⁶⁵ Banks, *supra* note 18, at 118–19 (“[There is] political power inherent in the decision as to what issues are to be considered and when to bring them before a science court. . . . [T]hroughout the process of selecting and stating the issue, through formulating and challenging the resultant factual statements, opportunities abound for the application of value judgments. Other than the challenge procedure, which is at the end of the entire process, there is no mechanism to control these value judgments. Unless the factual statements can be objectively formulated, a science court would likely render an erroneous, unresponsive, or at best, challengeable decision. . . . [While] scientific advisory committees . . . have, over the years, operated [with similar concerns] without particular difficulty[,] . . . a science court proceeding would be conducted with greater visibility and authority.”); Thomas G. Field, Jr., *Pursuing Transparency Through Science Courts*, 11 RISK 209, 218 (2000) (arguing that the science panel court would be “more arbitral than judicial,” due to “referees” taking individualized control from the judges and the utilization of ad hoc panels); David J. Damiani, Comment, *Proposals for Reform in the Evaluation of Expert Testimony in Pharmaceutical Mass Tort Cases*, 13 ALB. L. J. SCI. & TECH. 517, 545 (2003) (“The potential problems of bias and a lack of accountability also pose as a barrier for expert panels and science courts or judges.”).

²⁶⁶ Regarding the CSJ's appellate procedure, see discussion *infra* Part IV.B.3.

²⁶⁷ For an example of scientists reviewing the scientific merits of judicial decisions, see Sander Greenland, *Relation of Probability of Causation to Relative Risk and Doubling Dose: A Methodologic Error That Has Become a Social Problem*, 89 AM. J. OF PUB. HEALTH 1166 (1999) (analyzing judicial handling of epidemiologic evidence).

²⁶⁸ Jurs, *supra* note 9, at 96 (citing 28 U.S.C. § 137 (2006); J. Robert Brown & Allison Herren Lee, *Neutral Assignment of Judges at the Court of Appeals*, 78 TEX. L. REV. 1037, 1090 (2000)).

As a federal trial-level court, the standard Federal Rules of Civil Procedure and Federal Rules of Evidence should apply.²⁶⁹ This is not to say that judges will not use the rules in a distinct manner at the CSJ,²⁷⁰ but the same rules, granting the same due process rights, should apply.

In making any decision that may be dispositive, whether a ruling on a Motion for Summary Judgment or *Daubert* challenge to an expert, the CSJ judges should formalize their decisions into distinct and separate components. As was the case in the Kantrowitz proposal, all opinions should include a statement of uncontested facts, a statement of contested facts, conclusions on the facts to the extent they can be determined, and a section discussing the areas lacking scientific data on which to base a determination.²⁷¹ The differentiation of these distinct areas of decision, and the application of legal precedent to those facts, is a crucial part of what the CSJ should accomplish.²⁷² The benefits of this procedure include the following: increased clarity of the bases for any decision, the express recognition of what areas are less well established, the clarity of the precedential value that will be applied to the *legal* determinations of the court but not to the factual findings, and the establishment of a methodological precedent for assessment of similar factual issues by future courts—whether at the CSJ, federal, or state level.

On the procedural issue of trial format, the CSJ would retain the jury trial right inherent in the Seventh Amendment to the U.S. Constitution.²⁷³ In their science court proposal, Luneburg and Nordenberg suggested that bench trials would be permissible in the most complex cases, based on Supreme Court precedent.²⁷⁴ While Nordenberg and Luneberg relied on the Supreme Court decision in *Atlas* from 1977, the Supreme Court has, since the article debuted in 1981, clarified that “[Congress] lacks the power to strip parties contesting matters of private right of their constitutional right to a trial by jury.”²⁷⁵ Forcing a bench trial on claims against the will of the litigants is therefore impermissible under any circumstances short of constitutional amendment, and as such can no longer be considered.

In addition, Justice Breyer persuasively argues that not only must the law be accurate—as the CSJ is designed to encourage—but it must serve other interests as well: fairness, protection of liberties, and ensuring the jury trial right. Breyer specifically mentions that jury trials cannot bow to scientific accuracy, “Any effort to bring better science into the courtroom must respect the jury’s constitutionally specified role—even if

²⁶⁹ FED. R. CIV. P. 1 (“These rules govern the procedure in all civil actions and proceedings in the United States district courts”); FED. R. EVID. 101 (“These rules govern proceedings in the courts of the United States”).

²⁷⁰ In particular, the rules most likely to be used to a greater extent at CSJ include the following: FED. R. CIV. P. 16 (pretrial conferences); FED. R. EVID. 201 (judicial notice); FED. R. EVID. 614(b) (court may question witnesses, including experts, *sua sponte*).

²⁷¹ Task Force, *supra* note 56, at 655.

²⁷² See, e.g., Jurs, *supra* note 9, at 88–89 n.256 (Proposed Rule of Civil Procedure 74(e)).

²⁷³ U.S. CONST. amend. VII.

²⁷⁴ See *supra* text accompanying notes 139–41; see also Note, *The Case for Special Juries in Complex Civil Litigation*, 89 YALE L.J. 1155, 1161–66 (1980) (discussing the use of “blue ribbon” juries in complex cases).

²⁷⁵ *Granfinanciera v. Nordberg*, 492 U.S. 33, 51–52 (1989).

doing so means, from time to time, what is, from a scientific perspective, an incorrect result.”²⁷⁶ For these reasons, the CSJ would maintain the constitutionally protected jury trial right, while ensuring the jury hears only the best, legally admissible and vetted scientific evidence.

Even if a jury is to hear previously vetted science, there is no reason to prohibit jurors at the CSJ from taking advantage of new mechanisms to maximize their abilities to handle the material. Professor Franklin Strier, in his article *Making Jury Trials More Truthful*, offers suggestions for several methods to increase jury accuracy: asking questions, note taking, videotape/transcripts of critical testimony, or even interim deliberations.²⁷⁷ Because more complex material is even less well suited to juror comprehension,²⁷⁸ the CSJ provides an ideal environment to utilize these tools for greater juror accuracy.

Finally, the CSJ appellate right will be different than other district courts. Appeals should go to a single forum in order to maximize the expertise of the appellate-level review of its cases. Since the CSJ would be located in a single location²⁷⁹ to take advantage of having all fields of expertise under the same roof, it makes the most sense that the appeals of the CSJ opinions would go to a single appellate court. The success of the Court of Appeals for the Federal Circuit makes it a natural location for the CSJ appeals.²⁸⁰ It makes sense that the same court, which is used to handling complex science and technology cases, would result in similar benefits for the CSJ appeals docket. Of course, the increase in the docket would require additional judicial appointments, but even with the appointments the Federal Circuit could remain smaller than the Ninth Circuit.²⁸¹ New judicial appointments also could bring immediate expertise and experience in diverse science and technology fields to the bench as well.²⁸² Over time, the Federal Circuit could handle the CSJ docket with the same skill with which it handles patent law.²⁸³

C. Benefits of the Proposal

The proposed CSJ would involve immediate benefits to the analysis of complex

²⁷⁶ Breyer, *supra* note 229, at 26.

²⁷⁷ Strier, *supra* note 238, at 137–41 (reviewing the criticisms of each, and finding that each criticism is unsupported by the state of current research); *see also* Franklin D. Strier, *Through the Juror's Eyes*, A.B.A. J., Oct. 1988, at 78.

²⁷⁸ Strier, *supra* note 238, at 133.

²⁷⁹ Since the CSJ should be located in a single location, the choice of Washington, D.C., provides the greatest benefits to the institutional mission. Jurs, *supra* note 9, at 94.

²⁸⁰ Regarding the success of the CAFC, *see supra* Part III.C.3. Regarding the calls for other specialized appellate courts, *see* Damle, *supra* note 248, at 1280–81. *See also* Kondo, *supra* note 150, at text accompanying n.425. The location proximity to the CAFC for the CSJ is a secondary but not insignificant consideration as well. *See* sources cited *supra* note 279.

²⁸¹ 28 U.S.C. § 44(a) (2006) (setting the current statutory size of the Federal Circuit at 12, and the Ninth Circuit at 29).

²⁸² *See* DiLello, *supra* note 12, at 490–92 (reviewing the slow development of expertise in patent law for the Federal Circuit).

²⁸³ Dreyfuss, *supra* note 3, at 85; *see also supra* Part III.C.3.

cases involving science, technology, and related fields.²⁸⁴ These benefits include the commonly cited accuracy, efficiency, and consistency, but other tangible improvements as well.

1. The Basics: Efficiency, Accuracy, and Consistency

Specialized courts can increase judicial efficiency in handling dockets. Since 1990, the caseload of the federal district courts has increased significantly.²⁸⁵ Judicial delay has been an issue for much of this period.²⁸⁶ The CSJ would alleviate systematic strain in two ways: by taking the most difficult and technically challenging cases away from the standard district courts where they take great effort and time to resolve, and by streamlining the judicial analysis of those cases in a framework that can better handle the case. The generalist federal district court must take significant time and effort to learn specifics of technical or scientific material for even just one case;²⁸⁷ these skills often are not re-used in other similar cases.²⁸⁸ To alleviate the strain these cases have on the generalist judges, the CSJ would shift them away from the general docket to the CSJ for specialized handling.²⁸⁹ Once at the CSJ, the judges who handle cases within or near their area of expertise would be in a better position to handle the complexities of the caseload,²⁹⁰ and would gain additional efficiency through their repeated analysis of similar cases.²⁹¹ Efficiency is a clear goal of the CSJ, achievable through the court's structure and jurisdiction.

Accuracy is the second basic benefit of the CSJ.²⁹² When CSJ judges receive a docket, the judge will be able to evaluate the case in light of his or her substantial background knowledge in the field.²⁹³ With that background knowledge, the judge can more critically assess the proffered testimony before applying the appropriate standards of the law.²⁹⁴ These trained judges will be better able to separate the genuine claims or assertions from those not supported by the current state of scientific knowledge.²⁹⁵ We need not guess whether that result would happen, however. In examples of current

²⁸⁴ Regarding the jurisdictional limits of the court, see *supra* Part IV.B.1.

²⁸⁵ The number of outstanding federal civil cases has grown from 241,512 in 1990 to 298,129 in 2008. JAMES C. DUFF, ADMIN. OFFICE OF THE U.S. COURTS, JUDICIAL BUSINESS OF THE UNITED STATES COURTS: 2008 ANNUAL REPORT OF THE DIRECTOR 137 tbl.C, available at <http://www.uscourts.gov/judbus2008/appendices/C01Sep08.pdf>; U.S. COURTS, 2007 JUDICIAL FACTS AND FIGURES tbl.4.1, available at <http://www.uscourts.gov/judicialfactsfigures/2007/Table401.pdf>.

²⁸⁶ See, e.g., Doreen Carvajal, *Awaiting Judgment: A Special Report; New York's Clogged U.S. Courts Delaying Civil Verdicts for Years*, N.Y. TIMES, Apr. 17, 1995, at A1.

²⁸⁷ Potter, *supra* note 3, at 258–59; Whitney, *supra* note 43, at 504; DiLello, *supra* note 12, at 482.

²⁸⁸ See DiLello, *supra* note 12, at 482.

²⁸⁹ See Damle, *supra* note 248, at 1276 (citing Richard L. Revesz, *Specialized Courts and the Administrative Lawmaking System*, 138 U. PA. L. REV. 1111, 1120 (1990)).

²⁹⁰ Whitney, *supra* note 60, at 48; Damle, *supra* note 248, at 1277.

²⁹¹ Baum, *supra* note 255, at 1676; Whitney, *supra* note 60, at 48; DiLello, *supra* note 12, at 493.

²⁹² This Article uses the definition of accuracy assigned by Professor Dreyfuss: the extent to which the law produces an objectively correct result. Rochelle C. Dreyfuss, *Forums of the Future: The Role of Specialized Courts in Resolving Business Disputes*, 61 BROOK. L. REV. 1, 12 (1995).

²⁹³ Damle, *supra* note 248, at 1277; see *supra* Part IV.B.2.

²⁹⁴ See, e.g., Luneburg & Nordenberg, *supra* note 7, at 988; Potter, *supra* note 3, at 258.

²⁹⁵ Luneburg & Nordenberg, *supra* note 7, at 988; Martin, *supra* note 58, at 492.

specialized courts, the decisions and processes have been deemed objectively “better” as compared to generalist courts.²⁹⁶ Specialist judges seem to be more accurate when overseeing cases involving complex scientific or other evidence or claims, such as business, science or tax matters.

Third, the increase in consistency of decision making from a specialized court handling all cases of a similar nature cannot be doubted.²⁹⁷ Expertise feeds consistency through the prism of scientific accuracy.²⁹⁸ It also would be the result of a uniform interpretation of the appropriate legal standards.²⁹⁹ This single interpretation theory avoids a splintering of approaches regarding the same legal standard,³⁰⁰ more likely with more cases in more districts.³⁰¹ As one example, the Federal Circuit has resulted in consistency in patent law since its jurisdictional consolidation of patent cases in 1982.³⁰² Other commentators often assess consistency as a primary benefit of application of specialization to other bodies of law outside the patent realm.³⁰³ As a result of scientific accuracy and uniform legal interpretations, the CSJ would undoubtedly result in more consistent case law in the fields subject to its jurisdiction.

Efficiency, accuracy, and consistency form the troika of initial benefits from the development of a complex science docket at the CSJ.

2. The Others: Due Process, Externalities, and Inter-Systemic Assistance

In addition to the more commonly-cited examples of the benefits discussed above, the CSJ would have certain other benefits meriting specific discussion.

The CSJ would incorporate expertise in the judicial role, to better handle complex materials and produce better results, and would do so without ending some traditions of due process. The science court proposal by Luneburg and Nordenberg, by contrast,

²⁹⁶ See, e.g., Dreyfuss, *supra* note 292, at 18–19 (assessing the Delaware Court of Chancery, which has “captured benefits of specialization fully, without paying a high cost in terms of quality erosion”); Dreyfuss, *supra* note 3, at 24 (assessing the Federal Circuit); see also Baum, *supra* note 255, at 1677 (assessing the positive effects on decision quality from specialization, seeing those effects as “likely,” while cautioning that some negative effects may exist as well); *supra* section III.C.

²⁹⁷ Consistency is either the reduction in court conflicts through different interpretations, as in Baum, *supra* note 255, at 1675, or the likelihood that two courts will reach the same result on similar or the same case. Dreyfuss, *supra* note 3, at 8 (discussing precision); see also *supra* text accompanying note 225.

²⁹⁸ Luneburg & Nordenberg, *supra* note 7, at 988. This is one basic concern that drove Kantrowitz to develop the science court in the first place: “One of the great considerations before our society is how long we will tolerate the partisan exploitation of scientific uncertainty.” Kantrowitz, *supra* note 6, at 4.

²⁹⁹ See Damle, *supra* note 248, at 1278.

³⁰⁰ See Erica Beecher-Monas, *Blinded by Science: How Judges Avoid the Science in Scientific Evidence*, 71 TEMP. L. REV. 55, 80–81 (1998) (noting that courts apply different standards under same legal precedent, such as *Daubert*).

³⁰¹ Baum, *supra* note 255, at 1675; Damle, *supra* note 248, at 1278.

³⁰² Dreyfuss, *supra* note 3, at 13–14 (stating that precision is a benefit “when similar issues arise repeatedly before the same group of adjudicators”).

³⁰³ See, e.g., Brennan, *supra* note 3, at 524, 529 (hazardous substance claims); Kondo, *supra* note 150; *supra* text accompanying note 175 (intellectual property law); Potter, *supra* note 3, at 258 (judicial review of Forest Service decisions); Whitney, *supra* note 43, at 500 (environmental issues).

would have significantly modified the jury trial right by allowing “blue ribbon” juries or by eliminating the jury entirely.³⁰⁴ Luneburg and Nordenberg’s proposal and others with similar structure would have sacrificed due process considerations for the accuracy achieved by expertise. In addition to seeking the truth, trials should also incorporate fundamental values.³⁰⁵ Chief among these are the fundamental rights under the U.S. Constitution, including jury trials under the Seventh Amendment. Justice Breyer’s comments in *Judicature* reflect these commitments.³⁰⁶ The CSJ structure would also reflect these values and avoid the countervailing pressures to circumvent aspects of traditional due process.

A second benefit of the CSJ as proposed, coming through the incorporation of expertise in the judiciary, would be the assessment of the individual case within the context of the current state of science or technology. In a purely adversarial system, the evidence presented by the parties represents the sum of the information before the court. However, as a case increases in complexity, a purely adversarial adjudication is more likely to miss related and important information not represented by the parties.³⁰⁷ By reducing the purely adversarial nature of the proceedings through the incorporation of separate expertise within the judge’s background, the CSJ would allow for the consideration of material that may not otherwise be available in the case.³⁰⁸ In doing so, these “externalities” would be appropriately considered through the use of established procedural rules.³⁰⁹ As a result, the CSJ would have the potential to more accurately reflect the entire state of knowledge rather than those issues and principles encased within the boundaries drawn by partisan experts.

Finally, while the CSJ would be structured as a federal trial court, it would have beneficial effects on other courts—whether state, appellate, or administrative—that handle similar issues. Significant cases will necessarily remain outside the subject matter or constitutional jurisdiction of the CSJ.³¹⁰ Courts without experience handling complex civil litigation may lack essential tools to manage a case of significant complexity.³¹¹ As a result, the court’s management of scientific evidence could suffer. However, with the

³⁰⁴ Luneburg & Nordenberg, *supra* note 7, at 899; *see supra* text accompanying notes 132–43.

³⁰⁵ Laurence H. Tribe, *Trial By Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1391–92 (1971) (noting that due process rights reflect values of the society, both actual and aspirational); *see also* Colleen P. Murphy, *Integrating the Constitutional Authority of Civil and Criminal Juries*, 61 GEO. WASH. L. REV. 723 (1993).

³⁰⁶ Breyer, *supra* note 229, at 26; *supra* text accompanying note 285.

³⁰⁷ Strier, *supra* note 238, at 114; *see also* Rochelle Cooper Dreyfuss, *The Federal Circuit: A Continuing Experiment in Specialization*, 54 CASE W. RES. L. REV. 769, 780–83 (2004) (reviewing the insularity of the Federal Circuit in decision making, and its refusal to consider “extra-judicial materials”).

³⁰⁸ The judge will have to decide the relevance of his or her independent knowledge, but he or she will not and should not blindly “check it at the door.”

³⁰⁹ *See supra* note 270 (noting use of FED. R. CIV. P. 16, FED. R. EVID. 201, and FED. R. EVID. 614(b) may increase at the CSJ).

³¹⁰ *See discussion supra* Part IV.B.1. These include cases without diversity jurisdiction, cases with scientific issues deemed to not meet the jurisdictional standards, or administrative cases within agency purview. *See, e.g., In re Lockheed Litigation Cases*, 10 Cal. Rptr. 3d 34 (Cal. Ct. App. 2004); *Merrell Dow Pharms., Inc. v. Havner*, 953 S.W.2d 706 (Tex. 1997).

³¹¹ *See Richardson et al., supra* note 198, at 38.

CSJ providing detailed decision reports in a variety of case subjects,³¹² these courts could benefit from the CSJ expertise. Of course, while the case facts may differ, the structure of the decisions from the CSJ may provide significant insights into the application of complex science to the legal claims.³¹³ Therefore, these courts could apply CSJ precedent as a “road map” to assist their determinations.

In addition to the most common benefits claimed from specialization, the CSJ as proposed would also allow for recognition of the due process principles inherent in any legal claim, permit consideration of external or non-partisan scientific material in review, and generate results useful to other courts handling cases similar to those handled at the CSJ.

D. Criticisms

Any proposal of court specialization is bound to encounter serious criticism, whether by those opposed to any specialized courts or those concerned about the specifics of any particular proposal. The Kantrowitz proposal of the 1970’s was attacked repeatedly and directly by critics opposed to both its goals and its methods before it faded into obscurity.³¹⁴ The CSJ would likely see similar criticism.

One benefit of the CSJ is that the proposal has been formed in light of the Kantrowitz proposal. As a result, many significant criticisms of the Kantrowitz science court simply do not apply to the CSJ. These include the criticisms of the procedures for selection of advocates and judges, the issues to address,³¹⁵ and the methods of dispute resolution incorporating too many adversarial procedures.³¹⁶ All of these issues disappear as a case is filed in federal court, since the procedures, judge, advocates, and claims will immediately be apparent.

One criticism that critics leveled against the Kantrowitz proposal was that the decisions of the court would become the sole authority in the area, crowding out dissent; similar accusations might arise regarding the CSJ.³¹⁷ The CSJ would be extremely unlikely to suffer from a predisposition to authoritarianism, however, because the decisions would be created in a judicial framework where precedential effect of case law has a long history and known limits.³¹⁸ While science subject to adversarial inquest may

³¹² See *supra* text accompanying notes 272–73.

³¹³ Regarding the required structure of CSJ decisions issued by the judges, see *supra* Part IV.B.3. For an example of a state supreme court explicitly relying on the Rule 702 reliability determinations of other courts, see *State v. Kinney*, 762 A.2d 833, 841 (Vt. 2000) (“In some cases, both the trial court and this Court can fully evaluate the reliability and relevance of the evidence generally based on the decisions of other appellate courts.”).

³¹⁴ See discussion *supra* Part II.B.3.

³¹⁵ See *supra* notes 83, 87, 90–91 and accompanying text.

³¹⁶ See *supra* notes 92–96 and accompanying text.

³¹⁷ Critics of the Kantrowitz proposal thought the proposal was authoritarian in the sense that no one could question the judgment of the court, and those standing in opposition would be marginalized. See *supra* notes 98–102 and accompanying text.

³¹⁸ See, e.g., Thomas Healy, *Stare Decisis as Constitutional Policy*, 104 W. VA. L. REV. 43 (2001); Thomas R. Lee, *Stare Decisis in Historical Perspective: From the Founding Era to the Rehnquist Court*, 52

be determined to be stronger or weaker within the framework of the law, it seems unlikely this will have the Orwellian *1984* effects critics ascribed to the Kantowitz proposal.

Another common criticism of specialized courts is that their focus on one area results in judicial “myopia” leading to weaker judicial decision making.³¹⁹ In his article *Untangling the Tangled Web: Federal Court Reform Through Specialization For Internet Law and Other High Technology Cases*, Leroy Kondo directly addresses this concern in the context of intellectual property and internet law.³²⁰ He challenges the “myopia” argument by noting that the argument relies on a series of assumptions about specialist versus generalist judges, such as one common assumption that specialist judges lose insight into “the broad panoramic policy landscape” beyond their narrow expertise.³²¹ Kondo concludes that this assumption is unwarranted, and concludes that there is little evidence to suggest that specialization affects judicial temperament.³²² The same would hold true for the CSJ: the specialization of the court would benefit the accurate determination of outcomes, but need not encapsulate tunnel-vision or ensure judicial disinterest in areas beyond the fields of specialization. Since we assume generalist judges can learn the science needed to make *Daubert* decisions, then we must also conclude that specialist judges—possessing specialized knowledge or expertise—will be able to learn the general materials necessary to the performance of their positions.³²³

Finally, critics of specialized judges often suggest that a specialized court is inherently susceptible to capture by particular interests.³²⁴ Kondo dismisses this idea as unsupported by the state of empirical work in specialized courts.³²⁵ Dreyfuss, in her analysis of the Federal Circuit, similarly determined that the court did not suffer from capture concerns, and was, “[w]ith regard to its patent jurisdiction . . . a fairly balanced court.”³²⁶ The design of the CSJ is even less likely than the Federal Circuit to succumb to capture. Capture is more likely to occur when the potential of any individual judge to affect policy increases, i.e., the addition of one “biased” judge would affect the overall judicial output.³²⁷ At the CSJ, judges would be trial-level judges grouped according to

VAND. L. REV. 647 (1999); Michael Stokes Paulson, *Abrogating Stare Decisis by Statute: May Congress Remove the Precedential Effect of Roe and Casey?*, 109 YALE L.J. 1535, 1543–67 (2000); Neil M. Richards, *Clio and the Court: A Reassessment of the Supreme Court’s Uses of History*, 13 J. L. & POL. 809 (1997).

³¹⁹ Kondo, *supra* note 150, at text accompanying nn.150–54 (citing RICHARD A. POSNER, *THE FEDERAL COURTS: CHALLENGE AND REFORM* 258 (1996)); Richard A. Posner, *Will the Federal Courts of Appeals Survive Until 1984? An Essay on Delegation and Specialization of the Judicial Function*, 56 S. CAL. L. REV. 761, 787 (1983); Simon Rifkind, *A Special Court for Patent Litigation? The Danger of a Specialized Judiciary*, 37 A.B.A. J. 425, 425–26 (1951).

³²⁰ Kondo *supra* note 150, at text accompanying nn.149–53.

³²¹ *Id.* (citing Posner, *supra* note 319, at 787).

³²² *Id.*

³²³ *Id.* at text accompanying n.153.

³²⁴ *Id.* at text accompanying nn.160–64; *see also* Dreyfuss, *supra* note 3, at 3 (citing RICHARD A. POSNER, *THE FEDERAL COURTS* 157 (1985)); Potter, *supra* note 3, at 259.

³²⁵ Kondo, *supra* note 150, at text following n.164.

³²⁶ Dreyfuss, *supra* note 3, at 29.

³²⁷ *See* DiLello, *supra* note 12, at 504–05.

background specialty, able to hear cases on their area of background and its neighboring subject areas.³²⁸ Since any subject matter is likely to have multiple available judges who are qualified in the applicable area of expertise, the marginal value of each judge seems less likely to attract capture than even the Federal Circuit.

The CSJ is designed, with the criticisms of the Kantrowitz science court and other court proposals in mind, to capture the benefits of specialization without unwanted consequences. The court's design minimizes chances for capture by particular interests, avoids the authoritarianism of Kantrowitz-type proposals, and seems unlikely to result in judicial myopia.

V. CONCLUSION

Science and the law provide two distinct methods for the discernment of truth, and in so doing, can be difficult to understand from the perspective of the other. Our judicial system must be able to reliably handle cases involving the most complex scientific principles, lest it create poor precedent to the detriment of both science and justice. Yet the adversarial methods currently in use grant large deference to judges who are unskilled in application of basic scientific principles, while the science presented in court often represents the partisan positions of retained experts.

Partisan pressures influencing scientific assessment of critical issues pushed Arthur Kantrowitz to consider objectification of scientific analysis in 1967, and it was the perception of increasing partisan influence that led to public debate of his proposed procedures in the mid-1970's. Kantrowitz suggested a critical question in that debate: "How long will we tolerate the partisan exploitation of scientific uncertainty[?]"³²⁹ A similar question must be asked of the judicial system as well: based on the increasing evidence, how long will we continue the current method of review of scientific evidence under *Daubert*, without incorporating the expertise of background training and skill into the system? Without the addition of expertise, we passively tolerate the current system and its weaknesses.

The Court of Scientific Jurisdiction is designed as an Article III trial-level federal specialty court, able to handle a discrete subset of the most complex and controversial cases by incorporating expertise into the decision-making process. The CSJ attempts to reduce adversarial framing of the scientific evidence presented to it, thus resulting in increased accuracy, efficiency, and consistency of results. The CSJ also benefits from the debates of the 1970's on how to make science more objective, to focus on the quality of the science presented, and to reduce the interference of other influences. Finally, in light of the success of other specialized courts in both the federal system and in the states, the CSJ makes more sense today than ever before.

Justice Breyer, in his essay on science and the law, noted that the search for more accurate science requires the legal system to search for scientific accuracy, but the search

³²⁸ See *supra* text accompanying notes 261–62.

³²⁹ Kantrowitz, *supra* note 6, at 4.

must cede to other countervailing pressures: the need for fairness, justice, and protection of human liberty.³³⁰ The CSJ proposal would achieve this balance by incorporating expertise for better outcomes while simultaneously maintaining fundamental guarantees of due process. As a result, the court would offer significant advantages over the current system for complex science-related case management.³³¹

³³⁰ Breyer, *supra* note 229, at 26.

³³¹ Sanders, *supra* note 15, at 77 (arguing specialized courts offer improvements over the status quo).