

ARTICLES

HOW COURTS CAN ADEQUATELY ADJUDICATE  
ISSUES FROM AI TO ZONOTIC DISEASES:  
A PROPOSAL TO INCREASE THE INSTITUTIONAL  
CAPACITY OF COURTS TO ADDRESS COMPLEX  
MATTERS

*Kevin Frazier*

## ABSTRACT

*An “I know it when I see it” approach<sup>1</sup> to adjudication will not work in the case of existential risks: the stakes are too high to allow intuition to become the law of the land. Thorough adjudication of matters involving complex and evolving sources of such risks—ranging from AI to Zoonotic diseases—requires addressing a knowledge gap in courtrooms. Today’s lawyers and judges generally lack scientific and technological backgrounds. Continuing Legal Education sessions and judicial education programs cannot make up for that knowledge deficit due to their timing and substance. The capacity of the judicial system to handle matters involving existential risks posed by scientific and technological advances requires a new approach.*

*This paper proposes a series of short-, medium-, and long-run steps to improve the institutional capacity of courts presiding over such issues. In the short run, stakeholders in the legal system—including litigants and advocates as well as civil society organizations—should remind federal district courts of their inherent power to appoint technical experts as well as experts pursuant to Rule 706 of the Federal*

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<sup>1</sup> *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring).

*Rules of Evidence.*<sup>2</sup> Additionally, the American Bar Association should amend its metrics for evaluating nominees to the federal bench to include an evaluation of the nominee’s familiarity with science and technology.<sup>3</sup>

*In the medium-run, rule 706 of Federal Rules of Evidence should undergo reform to permit district courts to appoint panels of experts that can conduct assessments of matters involving existential risks. And—in line with Rule 2.5 of the Model Code of Judicial Conduct which requires judges to perform their duties "competently,"<sup>4</sup> —the federal statute that governs when judges must disqualify themselves should be amended to mandate disqualification when a judge lacks the background knowledge to adjudicate a case or refuses to acquire such knowledge through available mechanisms.<sup>5</sup>*

*Finally, in the long-run, legal education itself must become more interdisciplinary to increase the overall capacity of the profession to competently advise, interpret, and adjudicate matters involving existential risks arising from complex and evolving scientific and technological matters.*

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<sup>2</sup> See FED. R. EVID. 706.

<sup>3</sup> See *Ratings of Article III and Article IV Judicial Nominees*, AM. BAR ASS’N (last visited Aug. 10, 2023), [https://www.americanbar.org/groups/committees/federal\\_judiciary/ratings/](https://www.americanbar.org/groups/committees/federal_judiciary/ratings/); *Frequently Asked Questions*, AM. BAR ASS’N (accessed Aug. 10, 2023), [https://www.americanbar.org/groups/committees/federal\\_judiciary/ratings/evaluations-faq/](https://www.americanbar.org/groups/committees/federal_judiciary/ratings/evaluations-faq/).

<sup>4</sup> MODEL CODE OF JUD. CONDUCT r. 2.5 (AM. BAR ASS’N 2020).

<sup>5</sup> See 28 U.S.C. § 455.

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*Kevin Frazier\**

INTRODUCTION

An “I know it when I see it” approach<sup>6</sup> to adjudication may work in some contexts but, for obvious reasons, will not in the case of existential risks: the stakes are too high to allow intuition to become the law of the land. Imagine, for instance, the following scenario:

In the wake of ChatGPT6 being released and demonstrating capabilities beyond those even imagined by OpenAI CEO Sam Altman, U.S. Senators Marco Rubio (R-FL) and Ron Wyden (D-OR) sponsor the “Responsible AI Development Act.”

The Act defines “Frontier AI” as “any Artificial Intelligence model that may cause irreversible, significant, and widespread harm.”<sup>7</sup> Furthermore, the Act authorizes the Secretary of the U.S. Department of Homeland Security to update that definition when necessary to prevent the occurrence of such harm.

Microsoft and Google immediately challenged the constitutionality of the bill under the Nondelegation Doctrine, the Major Questions Doctrine, and the Due Process Clause. The Big Tech rivals turned co-plaintiffs

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<sup>6</sup> *Jacobellis*, 378 U.S. at 197 (Stewart, J., concurring).

<sup>7</sup> Note that this is in no way an endorsement of this definition of Frontier AI or the hypothetical RAID Act.

allege that, as defined, “Frontier AI” is unconstitutionally ambiguous because it does not sufficiently identify the types of harms that may subject an AI model to additional regulation.

A federal district court judge receives the opening briefs and quickly gets distracted by phrases such as “Floating-Point Operations,” “compute,” “foundation model,” and “fine-tuning.” The judge asks their clerks to explain these concepts. The clerks, also at a loss but eager to help their judge, turn to ChatGPT to help them understand these AI concepts. Unsurprisingly, the clerks return from their “research” more confused than informed. They update the judge on their findings (or lack thereof). The judge tells the clerks that they will all just have to “do their best” and “trust their guts” for the duration of the suit.

Problematic, right? Likely, yes.<sup>8</sup>

Courts have and will continue to play a crucial role in evaluating the likelihood and magnitude of risks related to complex, interconnected, and evolving phenomena. Yet, the judiciary has yet to develop a plan for increasing its capacity to perform this function at both the trial and appellate levels. This article introduces a series of proactive steps to develop the capacity of the federal judiciary to better analyze evidence and claims related to sources of existential risk.

In the short-run, two steps should occur sooner than later. First, court observers—including litigants and advocates as well as civil society organizations—should remind district courts of their inherent power to appoint technical experts as well as experts pursuant to Rule 706 of the Federal Rules of Evidence.<sup>9</sup> Civil society organizations have a particular role to play in this awareness campaign—they can develop lists of local, qualified experts for court consideration when judges and juries need to evaluate claims arising from climate change litigation, emerging technology disputes, and the like.

Second, the American Bar Association should reform its metrics

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<sup>8</sup> Cristiano Lima, *Schumer Launches ‘All Hands on Deck’ Push to Regulate AI*, WASH. POST (June 21, 2023), <https://www.washingtonpost.com/technology/2023/06/21/ai-regulation-us-senate-chuck-schumer/>; see Marla N. Greenstein, *Judges Must Keep Up with Technology: It’s Not Just for Lawyers*, AM. BAR ASS’N (Nov. 1, 2014), [https://www.americanbar.org/groups/judicial/publications/judges\\_journal/2014/fall/judges\\_must\\_keep\\_up\\_with\\_technology\\_its\\_not\\_just\\_for\\_lawyers/](https://www.americanbar.org/groups/judicial/publications/judges_journal/2014/fall/judges_must_keep_up_with_technology_its_not_just_for_lawyers/); *Jacobellis*, 378 U.S. at 197 (Stewart, J., concurring).

<sup>9</sup> See FED. R. EVID. 706.

for evaluating nominees to the federal bench by adding a “familiarity with science and technology” component to “professional competence.”<sup>10</sup> This small change will lay the groundwork for the nomination and appointment of judges with backgrounds in STEM and other fields that will assist in the adjudication of existential risk claims. Importantly, few to no procedural barriers prevent these two steps from being expeditiously pursued.

In the medium-run, two more steps will further augment the capacity of the judiciary to handle these claims. Rule 706 should undergo reform to permit district courts to appoint panels of experts that can conduct more thorough and informative assessments of existential risk claims. As currently interpreted and applied, judges hesitate to appoint experts out of fear of disrupting the adversarial process and putting the court’s thumb on the scales of justice.<sup>11</sup> A revised Rule 706 could normalize the use of court-appointed experts and stem concerns of judge-induced bias through the selection of a panel of experts tasked with providing a joint report.

And, in line with Rule 2.5 of the Model Code of Judicial Conduct—which requires judges to perform their duties “competently”<sup>12</sup>—the federal statute that governs when judges must disqualify themselves should explicitly call for disqualification when a judge lacks the requisite background knowledge to adjudicate a case or refuses to acquire such knowledge through available mechanisms.

Finally, in the long-run, legal education itself must become more interdisciplinary to increase the overall capacity of the profession to competently advise, interpret, and adjudicate claims of existential risk. Absent the reorientation of the profession around the scientific and technological claims that seem likely to become ever larger parts of the legal system, lawyers will fall short of their duty to “seek the improvement of . . . the administration of justice and the quality of service rendered by the legal profession.”<sup>13</sup>

This paper proceeds in three parts. Part I defines existential risk and provides examples of the scientific and technological developments

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<sup>10</sup> See *Ratings of Article III and Article IV Judicial Nominees*, AM. BAR ASS’N (accessed Aug. 10, 2023), [https://www.americanbar.org/groups/committees/federal\\_judiciary/ratings/](https://www.americanbar.org/groups/committees/federal_judiciary/ratings/); *Frequently Asked Questions*, AM. BAR ASS’N (accessed Aug. 10, 2023), [https://www.americanbar.org/groups/committees/federal\\_judiciary/ratings/evaluations-faq/](https://www.americanbar.org/groups/committees/federal_judiciary/ratings/evaluations-faq/).

<sup>11</sup> See, e.g., *McCracken v. Ford Motor Co.*, No. 09–3995, 2010 WL 3010304 at \*4 (2010) (applying Pa. law).

<sup>12</sup> MODEL CODE OF JUD. CONDUCT r. 2.5 (AM. BAR ASS’N 2020).

<sup>13</sup> See MODEL RULES OF PRO. CONDUCT Preamble (AM. BAR ASS’N 2023).

making the occurrence of such risk more likely in both the short- and long-term. Part II details the gatekeeping function of judges. Part III discusses the short-, medium-, and long-term steps necessary to increase the capacity of federal courts to adjudicate claims involving existential risks. The paper concludes with a challenge to other disciplines to assist in the reorientation of the legal profession.

## I. DEFINING EXISTENTIAL RISKS AND IDENTIFYING EXAMPLES

Existential risk or "the potential for an outcome that would result in human extinction," according to the Global Catastrophic Risk Management Act,<sup>14</sup> has received substantial regulatory and popular attention as of late<sup>15</sup>—and for good reason. A growing and increasingly animated set of experts have warned that the technological advances that have afforded humanity tremendous benefits also have the potential to bring about our demise.<sup>16</sup> Popular media has picked up these concerns and introduced them to the public. WIRED magazine, for instance, published an article detailing the "top 10 threats facing civilisation," which included AI taking over the world, natural and engineered human disease imperiling humanity, and extreme climate change bringing down critical infrastructure.<sup>17</sup>

These risks have slowly but surely and, as of late, rapidly worked their way into legal disputes. The U.S. Supreme Court, in numerous cases, evaluated the proper scope of government powers in light of a pandemic.<sup>18</sup> The Court has also assessed the bounds of government action in response to climate change.<sup>19</sup> Lower federal courts have addressed similar issues. For instance, the Ninth Circuit denied that a group of young Americans had standing to assert their claim that the Fifth Amendment afforded a right to "a climate system capable of

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<sup>14</sup> Glob. Catastrophic Risk Mgmt. Act of 2022, S. 4488, 117th Cong. § 2(5) (2022).

<sup>15</sup> See, e.g., Andrew Gregory & Alex Hern, *AI Poses Existential Threat and Risk to Health of Millions, Experts Warn*, GUARDIAN (May 9, 2023), <https://www.theguardian.com/technology/2023/may/10/ai-poses-existential-threat-and-risk-to-health-of-millions-experts-warn>.

<sup>16</sup> See, e.g., Nick Bostrom & Milan Cirkovic, GLOBAL CATASTROPHIC RISKS (1st ed. 2011).

<sup>17</sup> Richard Benson, *From Nuclear War to Rogue AI, the Top 10 Threats Facing Civilisation*, WIRED (Dec. 2, 2017), <https://www.wired.co.uk/article/10-threats-civilisation-ai-asteroid-tyrannical-leader>.

<sup>18</sup> See Erica White, *COVID-19 Related Opinions and Orders from the U.S. Supreme Court*, THE NETWORK FOR PUBLIC HEALTH LAW (Jan. 9, 2023), <https://www.networkforphl.org/resources/covid-19-related-opinions-and-orders-from-the-u-s-supreme-court/>.

<sup>19</sup> See, e.g., *West Virginia v. EPA*, 142 S. Ct. 2587 (2022).

sustaining human life.”<sup>20</sup> Federal courts have also considered the legality of regulations pertaining to emerging technologies<sup>21</sup> as well as the seriousness of threats to democratic society posed by automation, artificial intelligence, and misinformation.<sup>22</sup> Observers anticipate that courts will see claims involving existential risks continue to make up a larger part of their docket.<sup>23</sup>

Humans, generally, have difficulty thinking of and responding to existential risks and their underlying causes<sup>24</sup>—donning a robe, as it turns out, does not alleviate these troubles.<sup>25</sup> Proper adjudication of claims involving existential risk requires two difficult tasks: first, thinking over long-time horizons; and second, understanding the science at issue. The first task exposes the limits of our collective reasoning and cognitive capacity—judges, again, are no exception. Like everyone else, judges rely on the same heuristics and succumb to the same biases as laypeople.<sup>26</sup> In the context of existential risks, these cognitive limits manifest through underestimations of long-term costs and benefits.<sup>27</sup>

Second, judges, though they have received substantial legal education, share the public’s ongoing battle to understand developments in science and technology—developments that often increase existential risk.<sup>28</sup> Common sense and familiarity (or lack thereof) often inform

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<sup>20</sup> *Juliana v. United States*, 947 F.3d 1159 (2020).

<sup>21</sup> *See, e.g., Brookfield Commc’ns., Inc. v. W. Coast Entm’t Corp.*, 174 F.3d 1036 (1999).

<sup>22</sup> *See, e.g., Force v. Facebook, Inc.*, 934 F.3d 53, 88, n.10 (2019) (Katzmann, J., dissenting in part).

<sup>23</sup> Katie Surma, *Climate Change Litigation Has Exploded, But Is It Making a Difference?*, INSIDE CLIMATE NEWS (July 27, 2023), <https://insideclimatenews.org/news/27072023/climate-change-litigation-explosion/>.

<sup>24</sup> Stegan Schubert et al., *The Psychology of Existential Risk: Moral Judgments About Human Extinction*, 9 *Sci. Reports* (2019).

<sup>25</sup> Radley Balko, *Judges are Terrible at Distinguishing Good Science from Bad. It’s Time We Stopped Asking Them to Do It*, WASH. POST (Sept. 28, 2017), <https://www.washingtonpost.com/news/the-watch/wp/2017/09/28/judges-are-terrible-at-distinguishing-good-science-from-bad-its-time-we-stopped-asking-them-to-do-it/> (discussing how judges generally lack the training necessary to thoroughly understand the epistemologies and methods of analyses used by scientists).

<sup>26</sup> Eyal Peer & Eyal Gamliel, *Heuristics and Biases in Judicial Decisions*, 49 *Ct. Rev.* 114, 116 (2013).

<sup>27</sup> *See, e.g., Ross Andersen, We’re Underestimating the Risk of Human Extinction*, ATLANTIC (Mar. 6, 2012), <https://www.theatlantic.com/technology/archive/2012/03/were-underestimating-the-risk-of-human-extinction/253821/> (citing research by Oxford’s Future of Humanity Institute).

<sup>28</sup> *See, e.g., Joe S. Cecil, Science Education for Federal Judges*, AM. BAR ASS’N (Nov. 1, 2017), [https://www.americanbar.org/groups/judicial/publications/judges\\_journal/2017/fall/science-educatifederal-judges/](https://www.americanbar.org/groups/judicial/publications/judges_journal/2017/fall/science-educatifederal-judges/).

whether judges and the public alike will accept certain scientific findings.<sup>29</sup> When judges struggle to grapple with science and technology, though, the stakes are much higher. Judge Hand pointed this out in 1911 when he wondered: “How long shall we continue to blunder along without the aid of unpartisan and authoritative scientific assistance in the administration of justice, no one knows; but all fair persons not conventionalized by provincial legal habits of mind ought, I should think, unite to effect some such advance.”<sup>30</sup> Breaking habits is hard—another thing that does not change by donning a robe. Legal habits, imbued with precedential value, may be even harder to shake. Yet, until recently, judges had developed a knack for knocking on the doors of experts to assist in the evaluation of complex matters. The next Part explores the role of judges as gatekeepers and their modern pivot away from “better practice[s].”<sup>31</sup>

## II. JUDGES AS GATEKEEPERS

“[G]eneral acceptance” of the scientific community used to play a determinative role in a judge’s decision whether to admit scientific opinion evidence,<sup>32</sup> the U.S. Supreme Court then explicitly established judges as the “gatekeepers” of such expert opinion testimony.<sup>33</sup> Since then, the concept of judges as gatekeepers has become entrenched.<sup>34</sup> Given the importance of this judicial responsibility,<sup>35</sup> whether judges have the skills, resources, and knowledge necessary to competently fulfill that role requires ongoing investigation. The current and expanding divergence between the scientific and technological knowledge of judges and the highly scientific and technological evidence they may admit justifies an examination into why judges have failed to use a key resource at their disposal to close that gap.<sup>36</sup> This Part introduces the historical

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<sup>29</sup> Sheila Jasanoff, *Science, Common Sense & Judicial Power in U.S. Courts*, 147 DAEDALUS 15, 15–19 (quoting Judge Jed S. Rakoff).

<sup>30</sup> *Parke–Davis & Co. v. H.K. Mulford Co.*, 189 F. 95, 115 (S.D.N.Y. 1911).

<sup>31</sup> See *infra* notes 38–41 and accompanying text (summarizing a U.S. Supreme Court case on those topics).

<sup>32</sup> See *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

<sup>33</sup> See *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 588 n.7 (1993).

<sup>34</sup> See generally Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence Among State Court Judges*, 22 CRIMINOLOGY, CRIM. JUST., L. & SOC’Y 20 (2021).

<sup>35</sup> See *id.* at 2 (noting that decisions made by judges when acting as gatekeepers may have a determinative effect on the outcome of a trial); see also *Daubert*, 509 U.S. at 588 n.7.

<sup>36</sup> See Cecil, *supra* note 28 (noting that judges often require science education “on



use of court-appointed experts by judges, the modern move away from that practice, and the ramifications of judiciary's failure to make expert consultation a norm.

In a bygone era, judges proactively consulted with experts to assist in the adjudication of complex evidence and claims. Some early twentieth-century judges, perhaps heeding Judge Hand's call to action, developed a norm of using court-appointed, non-adversarial experts to assist themselves as well as the jury better understand scientific and technological evidence.<sup>37</sup> The Supreme Court sanctioned this exercise of judicial humility in *Ex parte Peterson*.<sup>38</sup>

The majority in *Ex parte Peterson* held that "[c]ourts have (at least in the absence of legislation to the contrary) inherent power to provide themselves with appropriate instruments required for the performance of their duties."<sup>39</sup> One such instrument is the guidance afforded by "persons unconnected with the court."<sup>40</sup> Note that the Court went beyond approving such a practice by affirmatively declaring it a "better practice" that courts solicit such guidance "where accounts are complex and intricate."<sup>41</sup>

Since *Ex parte Peterson*, ever more "complex and intricate" matters have made their way before courts and no legislation contrary to judges appointing experts to assist with admissibility decisions has been enacted. In fact, in 1975, the adoption of Federal Rule of Evidence 706 permitted courts a formal legal basis for appointing such experts to serve yet another function—assisting the fact-finder with the merits decision.<sup>42</sup> This increase in judicial discretion to "phone a friend" (albeit, an impartial one) was quite timely. A series of decisions by the Supreme Court—in particular, *Daubert*<sup>43</sup>—allocated more responsibility to district court judges to determine the reliability and, thus, admissibility of scientific and technological evidence.<sup>44</sup>

If Judge Hand were still on the bench and true to his word, he

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short notice" and that judges must receive such education "for the litigation to proceed without delay").

<sup>37</sup> Joe S. Cecil & Thomas Willging, *Accepting Daubert's Invitation: Defining a Role for Court-Appointed Experts in Assessing Scientific Validity*, 43 EMORY L. J. 995, 1010 (1994).

<sup>38</sup> *Ex parte Peterson*, 253 U.S. 300, 312–14 (1920).

<sup>39</sup> *Id.* at 312.

<sup>40</sup> *Id.*

<sup>41</sup> *Id.* at 313.

<sup>42</sup> Sophia Cope, *Ripe for Revision: A Critique of Federal Rule of Evidence 706 and the Use of Court-Appointed Experts*, 39 GONZ. L. REV. 163, 165 (2003).

<sup>43</sup> *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 589 (1993).

<sup>44</sup> See Cope, *supra* note 42, at 167 (discussing the holdings of *Daubert* and related cases).

would surely avoid “blunder[ing] along” and use experts to assist him in the exercise of his tremendous power over complex evidence and claims.<sup>45</sup> Unfortunately, and, perhaps surprisingly, he would be alone among his peers.

From the late 1980s on,<sup>46</sup> scholars have been discussing why judges infrequently appoint experts to fulfill a necessary role in fair and accurate adjudication. For instance, in 1993, Joe Cecil and Thomas Willging, observed that “[j]udges view the appointment of an expert as an extraordinary activity that is appropriate only in rare instances in which the traditional adversarial process has failed to permit an informed assessment of the facts.”<sup>47</sup> The duo identified several other factors that further explained judicial divergence from “better practices.”

It turns out parties rarely asked judges to appoint experts and, even less frequently, aided judges with the identification of potential experts.<sup>48</sup> Notably, judges claimed that they had little trouble identifying experts; though the reason for that ease did not alleviate concerns about the effect of court-appointed experts—judges felt fine reaching out to personal and professional connections to locate the desired expert.<sup>49</sup> The researchers listed procrastination as another factor. Cecil and Willging summarize, “The opportunity to appoint an expert [was] often hindered by failure to recognize the need for such assistance until the eve of trial.”<sup>50</sup> The financial toll of hiring an expert also made the list of complicating and deterring factor.<sup>51</sup>

By the early 2000s, scholars identified a few other reasons why judges may refrain from appointing experts as technical advisors pursuant to *Ex parte Peterson* or as expert witnesses under Rule 706. Sample reasons include “confusion” in interpreting the scope of judicial discretion in appointing experts and additional policy concerns about interfering with the adversarial process.<sup>52</sup>

Whatever the reason, judges continue to leave experts and their expertise at the bus stop. In 2018, Joe Cecil and Daniel Rubinfeld

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<sup>45</sup> Parke–Davis & Co. v. H.K. Mulford Co., 189 F. 95, 115 (S.D.N.Y. 1911); *see also* note 30 and accompanying text.

<sup>46</sup> *See generally* Cope, *supra* note 42; Tahirih Lee, *Court-Appointed Experts and Judicial Reluctance: A Proposal to Amend Rule 706 of the Federal Rules of Evidence*, 6 YALE L. & POL’Y REV. 480 (1988).

<sup>47</sup> Joe S. Cecil & Thomas E. Willging, *Court-Appointed Experts: Defining the Role of Experts Appointed Under Federal Rule of Evidence 706*, 5 (1993).

<sup>48</sup> *Id.*

<sup>49</sup> *Id.*

<sup>50</sup> *Id.*

<sup>51</sup> *Id.*

<sup>52</sup> *See* Cope, *supra* note 42, at 170–77.

observed that courts rarely appoint experts despite the potential of those experts to offer more neutral evaluations of the issues and, ultimately, lead the trier of fact to reach "scientifically sounder decisions."<sup>53</sup> Cecil and Rubinfeld noted that by failing to appoint such experts, judges may fail to fulfill their "affirmative duty" to keep out evidence and testimony that lacks scientific validity and reliability.<sup>54</sup>

Importantly, such a failure is not a basis for a judge having a legal obligation to disqualify themselves. Though a judge must disqualify themselves when they have "a personal bias or prejudice concerning a party, or personal knowledge of disputed evidentiary facts concerning the proceeding,"<sup>55</sup> there is no such duty when the judge's biases or *lack* of knowledge implicates their ability to administer justice.

The next Part echoes and aims to amplify the concerns of Judge Hand and many others who identify as "fair persons not conventionalized by provincial legal habit."<sup>56</sup> By listing steps for proponents of the Rule of Law and administration of justice to advocate for in the short-, medium-, and long-run, this article can serve as a checklist for reformers and a benchmark of progress with respect to judicial competency when faced with evidence and claims related to existential risks.

### III. A ROADMAP TO INCREASED COURT CAPACITY TO ADJUDICATE EXISTENTIAL RISK CLAIMS

This Part offers specific recommendations for improving the quality of judicial consideration of scientific and technological claims that often involve existential risks and, thus, require more thoughtful and accurate review by the legal system's gatekeepers. Current approaches—in particular, the provision of reference manuals on scientific evidence and judicial education programs—to providing judges with the scientific and technological education necessary to adjudicate complex claims fail for several reasons: first, a temporal difference; second, a content mismatch; and third, an unsupported theory of change. This Part briefly addresses why neither of the main approaches to assisting judges as gatekeepers overcomes these shortcomings; next, it outlines an alternative set of steps to increase the capacity of courts to adjudicate complex evidence and claims.

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<sup>53</sup> Daniel L. Rubinfeld & Joe S. Cecil, *Scientists as Experts Serving the Court*, 147 DAEDALUS 152 (2018).

<sup>54</sup> *Id.*

<sup>55</sup> 28 U.S.C. § 455(b)(1).

<sup>56</sup> *Parke–Davis & Co. v. H.K. Mulford Co.*, 189 F. 95, 115 (S.D.N.Y. 1911)

“Rarely is there such advance notice of the scientific issues in a case that a judge would be able to undertake an extensive educational program or enroll in a college course,” explains Cecil.<sup>57</sup> Instead, such issues “arise quickly.”<sup>58</sup> Yet, current approaches do not resolve the unpredictable and rapid need for judges to become familiar with specific questions involving complicated scientific and technological matters. In fact, the provision of books such as reference manuals and organization of classes—like judicial education programs—resemble the sort of “college course” that Cecil labeled as untimely in the context of litigation. For obvious reasons, a judge is unlikely to have the time necessary to fully “read up” on the complex matter at issue.<sup>59</sup> Likewise, a judicial education program on the matter at issue is unlikely to have been scheduled in the weeks leading up to the trial. These approaches, though, have become the default to closing the educational gap between student (judges) and the test (the adjudication of complex evidence).

The second reason that the current approach does not adequately prepare judges reflects the dynamism and complexity of the topics at issue. Science and technology do not remain stagnant. Any reference manual—even if maintained online—and any judicial education program will lag behind developments in those fields.<sup>60</sup> In addition to the delivery mechanisms of judicial education—books and formal programs—being incongruous with the ever-changing state of scientific and technological matters, the authors and leaders of these programs lack the credentials to explain these matters to judges with little to no background in science and technology. Judges, rather than subject matter experts, generally teach their colleagues at judicial education programs; in fact, the National Judicial College touts that their programs are “[f]or judges and taught by judges.”<sup>61</sup> While judges surely serve as adequate educators on certain topics, they likely lack the background necessary to thoroughly and clearly explain emerging trends in science and technology.<sup>62</sup>

Third, even if judges had access to “just-in-time” judicial

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<sup>57</sup> Cecil, *supra* note 28.

<sup>58</sup> *Id.*

<sup>59</sup> See Evan Murphy et al., *Motivations, Barriers, and Impact of Continuing Judicial Education: A Survey of U.S. Judges*, 57 CT. REV. 40, 43–44 (2021).

<sup>60</sup> See, e.g., Scott Murray, *A Comprehensive Study of Technological Change*, MIT NEWS (Aug. 2, 2021), <https://news.mit.edu/2021/comprehensive-study-technological-change-0802> (summarizing research attempting to predict which technologies will develop the fastest).

<sup>61</sup> THE NAT’L JUD. COLL., <https://www.judges.org> (last visited Aug. 10, 2023).

<sup>62</sup> See Jules Epstein, *When Must Lawyers Learn Science?*, THE NAT’L JUD. COLL.: JUDICIAL EDGE (Jan. 21, 2016), <https://www.judges.org/news-and-info/when-must-lawyers-learn-science/>.

education resources that managed to clearly explain matters ranging from artificial intelligence to zoonotic diseases, current norms among members of the judiciary suggest that few judges would avail themselves of those resources.<sup>63</sup> To the extent that judges do seek out such resources, they often do so simply to satisfy professional requirements.<sup>64</sup> Even the provision of more content via Zoom and other online platforms might not draw significantly more participation than current offerings due to the wide range of learning styles among judges.<sup>65</sup> Furthermore, upending these norms and finding the funding and time required to scale up judicial education resources to meet the growing need for such education seems unlikely.<sup>66</sup> If the federal court system received an influx of funds, that financial support would likely go to other underfunded aspects of the system, such as creating new judgeships.<sup>67</sup>

The main sources of legal education programs—"seminars, workshops, conferences"<sup>68</sup>—do not provide judges with the requisite information in a timely or complete manner. It follows that increasing the capacity of the judiciary to address scientific and technological evidence must, at least in the short- and medium-run, focus on the availability and use of court-appointed experts.

#### A. Short-Run Steps

Calls for greater use of court-appointed experts should not result in texts from judges to their buddies asking if they know a guy or a gal who knows something about X or Y. That's why the first step in increasing court capacity to handle existential risk claims must be a concurrent

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<sup>63</sup> See, e.g., Emily Kadens, *The Puzzle of Judicial Education: The Case of Chief Justice Williams de Grey*, 75 BROOK. L. REV. 143, 145 (2009) (explaining that judges usually "[take] the oath, [join] the bench, and [go on] to fill the judicial role as if born in the robe"); Ed Cohen, *Most judges haven't tried ChatGPT, and they aren't impressed*, NAT'L JUD. COLL. (July 21, 2023), <https://www.judges.org/news-and-info/most-judges-havent-tried-chatgpt-and-they-arent-impressed/> (disclosing results of a survey suggesting that judges do not actively try to educate themselves on the benefits and limitations of emerging technologies, such as generative AI tools).

<sup>64</sup> See Murphy et al., *supra* note 59, at 43.

<sup>65</sup> See Shawn C. Marsh, *Judicial Educators' Perspectives on Trauma Education for the Judiciary*, 70 JUV. & FAM. CT. J. 55, 61 (2019).

<sup>66</sup> See Murphy et al., *supra* note 59, at 44.

<sup>67</sup> Thomas Kaplan, *Federal Courts, Running Out of Money, Brace for Shutdown's Pain*, N.Y. TIMES (Jan. 18, 2019), <https://www.nytimes.com/2019/01/18/us/politics/courts-money-government-shutdown.html>.

<sup>68</sup> Nancy Joseph, *Would United States Judges Benefit From More Graduate Training?* (2016) (unpublished LL.M. thesis, Duke University School of Law) (available at: <https://scholarship.law.duke.edu/mjs/4>).

effort to identify such experts and remind courts of their authority to appoint such experts.

Consider that in France, where members of the judiciary commonly call on experts, the courts themselves often publish lists of experts in a range of fields, including electric power, accounting, and company management.<sup>69</sup> Notably, French courts opt to collect and share these lists as no law mandates such an effort. This voluntary effort to help judges identify the necessary experts reflects the fact that the use of court-appointed experts has become a norm in France.<sup>70</sup>

Given that U.S. district courts are chronically and significantly understaffed,<sup>71</sup> it is unlikely that U.S. courts have the institutional capacity to emulate the searching and sharing done by their French counterparts. That is where civil society organizations (CSOs) can and should step in. Imagine, for instance, if top computer science universities such as UC Berkeley, Harvard, Stanford, and MIT identified the foremost AI experts who expressed a willingness to serve as court-appointed experts in relevant cases. My hunch is that public awareness of such experts, as well as pressure from parties, would compel courts to call on those experts. Returning to the hypothetical, Microsoft and Google, upon learning that the court planned to appoint an expert to assess the evidence offered by their respective experts, would likely prefer the court use such a list rather than call on an expert who had not been vetted by prestigious institutions.

Though this list compilation and awareness effort would take some time, it is feasible within a year or so and could be done at a low cost. Likewise, the American Bar Association (ABA) could pursue action in the short-run that may help increase the capacity of courts to adjudicate claims involving existential risks.

The ABA's Standing Committee on the Federal Judiciary ("the Committee") has, at the request of the President, evaluated nominees to the federal bench since 1953.<sup>72</sup> The Committee evaluates nominees on

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<sup>69</sup> Juliette Fortin & Romain Lortat-Jacob, *The Effective Use of Expert Witnesses in France*, FTI CONSULTING, INC. (May 26, 2022), <https://www.fticonsulting.com/en/france/insights/articles/effective-use-expert-witnesses-france>.

<sup>70</sup> *Id.*

<sup>71</sup> Dylan Matthews, *Federal Courts Are Understaffed. It's Everybody's Fault.*, WASH. POST (July 11, 2013), <https://www.washingtonpost.com/news/wonk/wp/2013/07/11/federal-courts-are-understaffed-its-everybodys-fault/>.

<sup>72</sup> AM. BAR ASS'N, *Standing Committee on the Federal Judiciary: What It Is and How It Works* (last updated Aug. 2023)

several attributes including (1) integrity, (2) professional competence, and (3) judicial temperament.<sup>73</sup> All three inform a nominee's ability to adjudicate claims involving existential risks.

Integrity, per the Committee, includes the nominee's diligence.<sup>74</sup> Judge Hand and others would likely argue that a diligent judge would take the time to study a claim, assess his or her ability (or lack thereof) to understand the science and technology underlying that claim, and, if necessary, research and reach out to experts to fill any such gaps in capacity.

Professional competence "encompasses such qualities as intellectual capacity, judgment, writing and analytical abilities, knowledge of the law, and breadth of professional experience."<sup>75</sup> Whether a judge incorporates expert input in fulfilling their affirmative duty to determine the validity and reliability of complex evidence surely falls within this broad category. After all, one of the hallmarks of intellect is knowing what you do not know.

Finally, the Committee's evaluation of judicial competence includes "open-mindedness" as well as "freedom from bias and commitment to equal justice under the law."<sup>76</sup> Though some may not see the connection between this qualification and a judge's willingness to consult experts, it is worth pointing out that relying solely on parties to identify such experts often places the "David" of the parties in a far worse position given that the "Goliaths" of litigation can afford to retain more experts as well as experts with more impressive credentials and experience.<sup>77</sup>

In short, the Committee's list of qualifications all indirectly implicate a judge's willingness to appoint experts. However, for court-appointed experts to become the norm, then such willingness ought to become a standard consideration of reviewing a judge's competence. If the Committee were to formally integrate a judge's use of experts into one of the preexisting qualifications, or develop a separate qualification, then

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[https://www.americanbar.org/content/dam/aba/administrative/government\\_affairs\\_office/fjc-backgroundunder.pdf](https://www.americanbar.org/content/dam/aba/administrative/government_affairs_office/fjc-backgroundunder.pdf) (noting that the George W. Bush and Donald Trump Administrations did not make use of the Committee's services).

<sup>73</sup> *Id.* at 3.

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

<sup>76</sup> *Id.*

<sup>77</sup> See Chris Kane, *Calling a Cease Fire in the "Battle of Experts" Collaborative Use of Experts in Construction Disputes*, AM. BAR ASS'N: UNDER CONSTRUCTION (Mar. 12, 2019),

[https://www.americanbar.org/groups/construction\\_industry/publications/under\\_construction/2019/spring/battle-of-the-experts/](https://www.americanbar.org/groups/construction_industry/publications/under_construction/2019/spring/battle-of-the-experts/).

judges aspiring for a higher court as well as other court observers may become increasingly aware of this attribute of judging and, by extension, gatekeeping. Alternatively, or in addition, the Committee could add “familiarity with science and technology” to “professional competence” and, in doing so, nudge judges to develop a record of learning with and from experts in other disciplines.

Of course, there is likely a litany of other short-run steps that could increase awareness of the experts left on the judicial sidelines and, in turn, produce pressure on judges to call on such experts. I look forward to other scholars offering up such ideas. They can count on me and the growing community of scholars interested in judicial education<sup>78</sup> to call out their research and share it with all other “fair persons” interested in the accurate and thorough adjudication of claims involving existential risks.

### *B. Medium-Run Steps*

Unlike short-run steps, the steps in the medium-run require formal legislative action or the development of entire new civil society organizations. One such step is significantly amending Federal Rule of Evidence 706. Other scholars have already offered excellent ideas for such reform, so I will briefly summarize and endorse their suggestions. For example, Sophia Cope urged Congress to revise how and when courts may appoint experts with “an eye toward consolidation and clarification.”<sup>79</sup> Specifically, rather than perpetuating the appointment of technical advisors under the common law and expert witnesses under Rule 706, Cope called for the creation of “one comprehensive rule . . . that authorizes the use of court-appointed experts for the two, primary purposes of assisting the judge with the admissibility decision and assisting the fact-finder, whether judge or jury, with the merits decision.”<sup>80</sup>

This “new” Rule 706,” as a formal revision to the Federal Rules of Evidence would, according to Cope, address any due process and fundamental fairness concerns expressed by skeptics.<sup>81</sup> She argued that the revision would spell out how to select and compensate experts, the roles experts could play in litigation, and other procedural guardrails to

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<sup>78</sup> See Murphy et al., *supra* note 59, at 40 (describing increased interest in judicial education).

<sup>79</sup> Cope, *supra* note 42, at 177.

<sup>80</sup> *Id.*

<sup>81</sup> *Id.*



prevent experts from injecting prejudice or some other evil into the case.<sup>82</sup>

Cope's suggestion, if adopted, could foster a norm of courts appointing experts by assuaging judicial concerns about their authority to do so and the possibility of "runaway" experts that undermine the adversarial process. That norm might take hold even sooner if Congress also amended Rule 706 to grant judges the authority to appoint a panel of up to three experts, which may be especially necessary in cases involving existential risks given the likelihood that experts in the underlying field have divergent and extreme perspectives.<sup>83</sup>

Returning to the hypothetical involving the "Responsible AI Development Act," the judge in that case would surely have significant concerns with appointing a single expert given the diverse and polarized perspectives of AI experts.<sup>84</sup> If limited to a single expert, the judge may end up selecting a scholar convinced that AI development must not continue, regardless of any regulatory efforts to mitigate risks posed by the technology.<sup>85</sup> Microsoft and Google would likely have grounds to object to such an appointment based on the expert's lack of neutrality.<sup>86</sup> The possibility of appointing a panel of experts, though, would not only increase the odds of the judge receiving a more comprehensive and nuanced perspective but also reduce the chances of the parties or the judge having concerns about bias.

For such a panel system to work in practice, CSOs would need to build on their short-run efforts to facilitate judicial use of experts. After CSOs had developed lists of local, qualified experts, these organizations

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<sup>82</sup> *Id.*

<sup>83</sup> The causes of existential risk do not lend themselves to expertise consensus. *See, e.g.,* Kelsey Piper, *How will AI Change Our Lives? Experts Can't Agree - and that Could Be a Problem*, VOX (Mar. 2, 2019), <https://www.vox.com/future-perfect/2019/3/2/18244299/possible-minds-architects-intelligence-ai-experts> (showcasing expert divergence on artificial intelligence); Mini Racker, *What We Know About the U.S. Intelligence Community's Split on COVID-19 Origins*, TIME (Feb. 28, 2023), <https://time.com/6258852/china-lab-leak-covid-19-us-disagreement/> (expert divergence on COVID-19); Mary Kate Aylward et al., *Welcome to 2033: What the World Could Look Like in Ten Years, According to more than 160 Experts*, ATL. COUNCIL (2022), <https://www.atlanticcouncil.org/content-series/atlantic-council-strategy-paper-series/welcome-to-2033/> (showcasing expert divergence on geopolitical disorder).

<sup>84</sup> James Vincent, *Elon Musk and Top AI Researchers Call for Pause on 'Giant AI Experiments'*, THE VERGE (May 29, 2023), <https://www.theverge.com/2023/3/29/23661374/elon-musk-ai-researchers-pause-research-open-letter>.

<sup>85</sup> *See id.*

<sup>86</sup> *See, e.g.,* Gartner v. Hendrix, No. 90-4980, 1991 U.S. Dist. LEXIS 11516 (E.D. La. Aug. 8, 1991) (involving a party contesting the neutrality of a court-appointed expert).

could next take on more complicated and resource-intensive tasks that would likewise help courts appoint such experts. France again serves as a useful guide for such tasks. Not only do French judges have ready access to a list of experts in a range of fields, they also have some of their concerns about the potential bias of such experts assuaged by a specific code of conduct for court-appointed experts. The National Council of Justice Expert Companies monitors experts and sets specific duties and standards for experts.<sup>87</sup> CSOs in the United States could develop a similar code. Note, though, that this constitutes a medium-run task given the substantial resources and time required to develop such an organization, formalize a code of conduct, et cetera.

Another medium-run step includes amending Section 455 of Title 28 of the United States Code to require judges to disqualify themselves if they lack the requisite background knowledge to adjudicate a case or refuse to acquire such knowledge through available mechanisms. Under Section 455(a), a judge “shall disqualify himself in any proceeding in which his impartiality might reasonably be questioned.”<sup>88</sup>

Courts have broadly interpreted this disqualification requirement. In *Liljeberg v. Health Services Acquisition Corp.*, 486 U.S. 847 (1998), for instance, the U.S. Supreme Court held that a judge must disqualify him or herself from acting in proceedings if his or her impartiality might reasonably be questioned. The Court supported that interpretation by setting forth a lofty goal for Section 455(a): to avoid even the appearance of partiality. The Seventh Circuit likewise interpreted Section 455(a) as having a broad scope. In *In re Volland*, 69 F.2d 475, 475 (1934), the court concluded that no judge could preside over a dispute when doing so may, in any way, embarrass their official capacity.<sup>89</sup>

Moreover, though in many cases Section 455(a) has been raised in response to allegations of judges having personal bias or prejudice in favor of a party, courts have emphasized that Section 455(a) covers a broad range of conduct.<sup>90</sup> In fact, courts have explicitly recognized that the disqualification requirement applies to conduct not anticipated by

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<sup>87</sup> *Background*, THE NAT’L COUNCIL OF CO. OF JUST. EXPERTS, <https://www.cncej.org/historique> (last visited Aug. 11, 2023).

<sup>88</sup> 28 U.S.C. § 455(a).

<sup>89</sup> A note to current and future judicial clerks: The 11th Circuit determined that clerks have a role in monitoring whether their judge’s actions may raise the appearance of impartiality and, if clerks conclude that such circumstances are present, then the court instructed them to take appropriate actions. *Parker v. Connors Steel Co.*, 855 F.2d 1510, 1525 (11th Cir. 1988), *reh’g denied en banc*, 864 F.2d 795 (11th Cir. 1988), *cert. denied*, 490 U.S. 1066 (1989).

<sup>90</sup> *United States v. Ritter*, 540 F.2d 459, 462 (10th Cir. 1976), *cert. denied*, 429 U.S. 951 (1976).

the drafters, as indicated by their intent to have judges disqualified pursuant to an objective standard—whether a reasonable factual basis exists to doubt a judge's impartiality.<sup>91</sup>

Though courts have outlined a litany of circumstances that would justify disqualification, Section 455(a) has yet to become a shield against judges being biased by their lack of knowledge and unwillingness to appoint neutral experts to assist in the evaluation of complex evidence and claims. When judges excessively rely on expert witnesses, they may struggle to remain impartial or, minimally, to maintain the appearance of impartiality. Judges lacking sufficient background knowledge on a complex topic or neutral guidance offered by a court-appointed expert (or panel of experts) may assume that the parties' respective expert witnesses "provide impartial and objective evidence" and grant their testimony undue weight.<sup>92</sup> However, according to Itiel E. Dror and his colleagues, "cognitive science shows that even the most dedicated and committed experts are influenced . . . by factors unrelated to the data relevant to form their expert conclusions."<sup>93</sup>

The public cannot wait for the common law to slowly and incrementally develop a basis for the disqualification of judges based on the appearance of a lack of impartiality that may result from a judge's insufficient subject-matter knowledge or unwillingness to engage in the necessary study, or unwillingness to consult with a court-appointed expert to develop such knowledge. Therefore, Section 455(a) should be amended to include such a basis. Specifically, Congress should make clear that judges shall not preside over an action when: (1) the judge knows or reasonably should know that the claims or evidence will likely require additional background knowledge to ensure impartial and accurate adjudication, and (2) the judge refuses to take reasonable efforts to acquire that knowledge.

This proposal may seem to suggest an 'experts' arms race' in which more and more experts are necessary to counter the biases of other experts, but that is not the case. Court-appointed experts have different incentives than party-selected experts.<sup>94</sup> Whereas the latter tend to

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<sup>91</sup> *United States v. Conforte*, 624 F.2d 869, 881 (9th Cir. 1980), *cert. denied*, 449 U.S. 1012 (1980).

<sup>92</sup> See Itiel E. Dror et al., *Cognitive Bias and Its Impact on Expert Witnesses and the Court*, 54 JUDGES' J. 8, 8 (2015).

<sup>93</sup> *Id.*

<sup>94</sup> See generally, H.D. Sperling, *Expert Evidence: The Problem of Bias and Other Things*, 4 JUD. REV. 429 (2000) (arguing that expert witness bias can be mitigated by court-appointment of experts or referees to examine testimony from party-selected expert witnesses).

overstate the evidence that advances their party's case or rely on irrelevant contextual information provided by their party,<sup>95</sup> court-appointed experts have no ties—financial, emotional, or otherwise—to the interests of either party and can receive information from the court pursuant to a standardized process that reduces the odds of consideration of extraneous information. Judges may push back on this obligation given that it would surely entail more effort on their end. This argument, though, lacks appreciation for the standard set for judges by the Model Code of Judicial Conduct.

Under Rule 2.5(a) of the Model Code, a judge “shall perform judicial and administrative duties, competently and diligently.”<sup>96</sup> The Comments to that rule suggest that judges who persist in presiding over an action that exceeds their scientific or technological capacity fall short of the ABA's expectations. For example, a judge fails to competently perform his or her duties when he or she fails to complete the “preparation reasonably necessary” to meet his or her responsibilities.<sup>97</sup> Our judge in the hypothetical has surely not undertaken the preparation necessary to adjudicate such an important and complicated dispute; the assistance of an expert could likely bring him or her into compliance with Rule 2.5. The Code also advises that judges should seek the necessary “expertise and resources to discharge all adjudicative . . . responsibilities.”<sup>98</sup> Here, again, our hypothetical judge and others who face similar disputes can cite the Model Code of Judicial Conduct to support their appointment of one or several experts. Finally, a judge “should monitor and supervise cases in ways that reduce or eliminate dilatory practices, avoidable delays, and unnecessary costs.”<sup>99</sup> Absent a court-appointed expert to aid a judge in understanding complex evidence and claims, a judge may delay proceedings by continuing to send their clerks on ChatGPT escapades. It follows that judges likely already have a professional obligation to appoint experts in many cases—a statutory obligation would simply provide the public and litigants with a means to monitor and enforce that obligation.

A statutory obligation that judges possess sufficient knowledge to impartially adjudicate disputes would also align with the standards with which lawyers must comply. The Model Rules of Professional Conduct (MRPC) state that a lawyer must have or seek out the requisite knowledge

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<sup>95</sup> Itiel E. Dror, *Biases in Forensic Experts*, 360 SCIENCE 243 (April 20, 2018) <https://www.science.org/doi/10.1126/science.aat8443>.

<sup>96</sup> MODEL CODE OF JUD. CONDUCT R. 2.5 (AM. BAR ASS'N 2020).

<sup>97</sup> *Id.* at cmt. 1.

<sup>98</sup> *Id.* at cmt. 2.

<sup>99</sup> *Id.* at cmt. 4.

and skill prior to taking a matter.<sup>100</sup> In assessing whether they can comply with that Rule, the MRPC instructs lawyers to consider:

the relative complexity and specialized nature of the matter, the lawyer's general experience, the lawyer's training and experience in the field in question, the preparation and study the lawyer is able to give the matter and whether it is feasible to refer the matter to, or associate or consult with, a lawyer of established competence in the field in question.<sup>101</sup>

The public and parties should expect judges to make the same assessment and, when judges fail to do so, to hold them accountable. As pointed out by Justice Stephen Breyer, “Proper resolution of those disputes [that involve the principles and tools of science] matters not just to the litigants, but also to the general public—those who live in our technologically complex society and whom the law must serve.”<sup>102</sup> Justice Breyer continued, “Our decisions should reflect a proper scientific and technical understanding so that the law can respond to the needs of the public.”<sup>103</sup> It is unreasonable, given our current approach to legal education, to assume judges have that understanding absent more information about what steps a judge has taken to acquire that understanding, such as through appointment of an expert or panel of experts. Thus, Section 455 should be amended. Claims that involve science, technology, and other fields that present existential risks mandate the demonstration of competence. Accordingly, just as the law requires judges to stay informed of their personal and pecuniary interests,<sup>104</sup> judges should have to honestly and openly evaluate whether their knowledge (or lack thereof) may result in biased and unfair adjudication.

### *C. Long-Run Steps*

The unavoidable truth is that the complexity of sources of existential risk necessitates a pivot in the legal profession. Our client-

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<sup>100</sup> MODEL RULES OF PRO. CONDUCT r. 1.1 (AM. BAR ASS’N 2020).

<sup>101</sup> *Id.* at cmt. 1.

<sup>102</sup> Stephen Breyer, *Science in the Courtroom*, 16 ISSUES IN SCI. & TECH. (2000), <https://issues.org/breyer-science-courtroom/>.

<sup>103</sup> *Id.*

<sup>104</sup> 28 U.S.C. § 455(c).

based, big-law driven approach to legal education and legal practice is unaligned with a world facing existential risks arising from rapid and unanticipated advances in science and technology. Since at least 1967, legal educators have observed the slow response of the law and legal education to the "exponential growth in scientific knowledge."<sup>105</sup> Professor Arthur Miller estimated that legal education lagged forty years behind scientific developments as of the 1960s;<sup>106</sup> worse yet, he predicted that law schools would fall further behind each year.<sup>107</sup>

Law schools do not appear to have caught up in the intervening years. Saddled by bureaucratic and bias-laden processes for updating curriculums and pedagogy, professor Chance Meyer noted in 2020 that "[t]he customary approach law schools take when deciding what organizational changes to make and how to see those changes through will not lead reliably to success."<sup>108</sup> He believes that "law schools need a disciplined methodology for developing and implementing [organizational and curricular] changes."<sup>109</sup> Part of that methodology must include consulting with other disciplines and coordinating ways to foster interdisciplinary learning.

Optimistically, about five percent of lawyers and judges have studied science.<sup>110</sup> The potential costs to society from so few legal practitioners being up to date on the risks posed by rapid scientific and technological progress have become too large to perpetuate the current approach to legal education. Returning to our hypothetical, if AI does pose existential risks, then whether the legal system upholds the Responsible AI Development Act could have significant ramifications across the globe for several generations. Courts will face similar cases in greater volume for the foreseeable future. Increased use of experts by courts can help close that gap. Ultimately, though, lawyers themselves need to minimally have the capacity to determine what they do not know about claims related to existential risks and how to acquire that knowledge—those are skills that must be developed in law school.

The precise ways law schools can train students in such skills

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<sup>105</sup> See Arthur Selwyn Miller, *Science and Legal Education*, 19 CASE W. RES. L. REV. 29, 29 (1967).

<sup>106</sup> *Id.* at 30.

<sup>107</sup> *Id.*

<sup>108</sup> Chance Meyer, *Law Schools Need Improvement Science, Now More Than Ever*, AM BAR ASS'N (2020), [https://www.americanbar.org/groups/legal\\_education/publications/syllabus\\_home/volume-51-2019-2020/syllabus-spring-2020-51-3/law-schools-need-improvement-science/](https://www.americanbar.org/groups/legal_education/publications/syllabus_home/volume-51-2019-2020/syllabus-spring-2020-51-3/law-schools-need-improvement-science/).

<sup>109</sup> *Id.*

<sup>110</sup> Epstein, *supra* note 62.

exceed the scope of this paper. Thankfully, several law schools have initiated programs, courses, and seminars that impart such skills. These efforts deserve more attention from and more replication by law schools. For instance, schools should strive to emulate UC Berkeley School of Law Professor Chris Hoofnagle's "Cybersecurity in Context" course.<sup>111</sup> Students from UC Berkeley's myriad computer science programs, public policy school, and law school jointly enrolled in the course. Professor Hoofnagle then encouraged cross-discipline discourse through several strategic decisions: he empowered students with extensive knowledge in their respective discipline to occasionally play the part of professor and share their insights with their colleagues, he set aside time for students to discuss hypotheticals with students from other disciplines, and he assigned readings from the different disciplines. In turn, students practiced "adopt[ing] different lenses . . . to better understand how different forces enable and constrain security technologies and policies"<sup>112</sup> and they improved their understanding of the frameworks and assumptions employed by other disciplines.

Not every school has the range of programs and expertise that exist at UC Berkeley. Schools lacking such diversity and depth in academic disciplines can remedy that absence by partnering with other institutions to participate in Zoom courses, conferences, and the like. In short, there are manifold ways for law schools to help future lawyers learn from and with future experts in other disciplines. Per Professor Meyer, though, such partnerships and programs will not emerge if law schools use the same methodologies that have left legal education in the dust of scientific and technological progress.<sup>113</sup> In response to existential risks, law schools cannot follow their traditional playbooks. The public today and members of future generations deserve a legal system and legal profession capable of understanding and responding to complex scientific and technological developments.

#### CONCLUSION

For decades, lawyers and scientists have struggled to develop a working relationship. James Friedman observed in 1977 that "it is not uncommon for a research scientist to be suspicious of lawyers, judges,

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<sup>111</sup> The author completed this course in Fall of 2020.

<sup>112</sup> Cybersecurity 200: Beyond the Code: Cybersecurity in Context, Berkeley School of Information (accessed Nov. 28, 2023), <https://www.ischool.berkeley.edu/courses/cyber/200>

<sup>113</sup> See Meyer, *supra* note 108.

and government officials."<sup>114</sup> Indeed, Friedman theorized that the more scientists became involved in legal processes, the more that suspicion would grow.<sup>115</sup> Of course, the difficulty in lawyer-scientist relationships goes both ways. "[M]any scientists," based on Friedman's time at the Woods Hole Oceanographic Institute, "are at least as peculiar and parochial as many lawyers."<sup>116</sup> Friedman's theories and observations appear to have withstood the test of time. Four decades later, Alex Berezow echoed Friedman and stated that "[s]cientists and lawyers do not get along."<sup>117</sup> The upshot is that members of both disciplines must make more deliberate and sustained efforts to remedy their differences and find ways to work together with as well as learn from one another.

Courts will soon—if they have not already—face questions involving quantum computing, bioengineering, AI, and solar radiation modification. All those concerned with the Rule of Law and the legitimacy of the judiciary must adopt a plan for readying courts to handle these complex topics. This plan should include the long-discussed reform of Rule 706 and much more. Ultimately, though, the legal profession must alter its focus—beginning with the nature, content, and length of law school. Experts in other disciplines can assist in this effort. First, such experts can continue to call out members of the legal profession for flawed understanding of their respective fields.<sup>118</sup> Second, such experts can call on their respective learning institutions to seek ways to collaborate with law schools. And third, when and if opportunities arise for such experts to serve as court-appointed experts, they can seize those opportunities and demonstrate the importance of legal decisions being grounded in accurate understandings of science and technology—especially in an age of existential risks.

This paper introduced several steps to remedy the current and

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<sup>114</sup> James Friedman, *Why Lawyers and Scientists Can't Talk to Each Other*, 18 JURIMETRICS J. 99, 99 (1977).

<sup>115</sup> *Id.*

<sup>116</sup> *Id.* at 99–100.

<sup>117</sup> Alex Berezow, *Will Lawyers Destroy Science?*, AM. COUNCIL ON SCI. & HEALTH (Dec. 29, 2017), <https://www.acsh.org/news/2017/12/29/will-lawyers-destroy-science-12340>.

<sup>118</sup> Scientists have done so. *See, e.g., Evidence Shouldn't Be Optional*, SCI. AM. (July 1, 2022), <https://www.scientificamerican.com/article/evidence-shouldnt-be-optional/>. In particular, forensic scientists have done so. *See, e.g., Matthew Scherb, Untested Forensic Sciences Present Trouble in the Courtroom*, AM. BAR ASS'N (Feb. 5, 2019), [https://www.americanbar.org/groups/judicial/publications/appellate\\_issues/2019/winter/untested-forensic-sciences-present-trouble-in-the-courtroom/](https://www.americanbar.org/groups/judicial/publications/appellate_issues/2019/winter/untested-forensic-sciences-present-trouble-in-the-courtroom/). And historians have done so. *See, e.g., AM. HIST. ASS'N, History, the Supreme Court, and Dobbs v. Jackson: Joint Statement from the AHA and the OAH* (July 2022), <https://www.historians.org/news-and-advocacy/aha-advocacy/history-the-supreme-court-and-dobbs-v-jackson-joint-statement-from-the-aha-and-the-oah->



expanding divergence between legal competency with respect to complex matters and the likelihood of irreversible and widespread risk posed by rapid and unanticipated scientific and technological progress. I welcome the suggestion of several alternative and complementary steps. Here is to mobilizing a community of “fair persons not conventionalized by provincial legal habits.”