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# A WORLD OF EXPERTS: SCIENCE AND GLOBAL ENVIRONMENTAL CONSTITUTIONALISM

SHEILA JASANOFF\*

Abstract: Under conditions of conflict and uncertainty, forging a new constitutional consensus is a monumental task. If we hope to address climate change through a new global constitutionalism, we must challenge current approaches to assessing the costs, benefits, and uncertainties of environmental regulation, and arrive at an international consensus regarding those approaches. In doing so, input from experts in a variety of fields should be sought. A positive example of this approach is the Intergovernmental Panel on Climate Change's inclusive and democratic process of environmental assessment. However, we must avoid abdicating responsibility in favor of complete reliance on experts, and remind ourselves that expertise—legal or scientific—should be questioned and tested by democratic participation.

## INTRODUCTION

Professors Douglas Kysar and David Wirth have described the patchiness of the world order and various barriers to progressive international action on global climate change—whether they are due to the absence of adequate institutions and formal mechanisms, or because extant ways of doing business contain principles that do not withstand moral scrutiny.<sup>1</sup> Professor Kysar referred to the latter situation when he discussed his initiative to go before the United Nations and argue that the rights or very existence of one community should never fall victim to the interests of another.<sup>2</sup> That such an argument needs to be made does not bode well for global constitutionalism.

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<sup>1</sup> See Professor Douglas Kysar's *Analysis of Flaws in Predictive International Climate Policy Models*, 40 B.C. ENVTL. AFF. L. REV. 409, 409 (2013) [hereinafter *Kysar Executive Summary*]; David A. Wirth, *Engineering the Climate: Geoengineering as a Challenge to International Governance*, 40 B.C. ENVTL. AFF. L. REV. 413, 420–36 (2013).

<sup>2</sup> See *Kysar Executive Summary*, *supra* note 1, at 406, 411 (describing the plight of Palau, a nation whose very existence is threatened by rising sea levels).

My starting point when thinking about the global order is slightly different. Coming as I do from a school of government rather than a school of law, I have the luxury of asking what it is that makes people agree to participate in a system of constitutional governance. Conversations about a world order among lawyers often carry with them a prior assumption—an assumption that existed in both Professor Kysar’s and Professor Wirth’s presentations.<sup>3</sup> The assumption seems to be that we *ought* to have some sort of global constitutional order, secured if possible through law.<sup>4</sup> In order to avoid rogue action by states that prioritize their own interests above another state’s rights, we need to have an intergovernmental constitutional settlement. Interrogating that assumption, we can ask whether the problem of global order today is an absence of constitutionalism or in some respects its opposite: a premature constitutionalism that already exists, partly through the influence of science and expertise,<sup>5</sup> but whose scope and limitations are not perceived as such or consented to by most citizens of the world.

### I. THE FOUNDATIONS OF GLOBAL ENVIRONMENTAL CONSTITUTIONALISM

To approach these questions, I will begin with a lesson that I remember vividly from my exposure to a constitutional law class at Harvard, taught by one of the great names in the field, Paul Freund. While I must admit to not remembering much of what he taught us about levels of judicial scrutiny, I do remember a story he told about how *Brown v. Board of Education*<sup>6</sup> became a governing constitutional doctrine. Although the Court expected the ruling to be incredibly divisive at the time, the rejection of the “separate but equal doctrine” came to be accepted as canon, so much so that even in our currently polarized

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<sup>3</sup> See Kysar *Executive Summary*, *supra* note 1, at 411; Wirth, *supra* note 1, at 435–37.

<sup>4</sup> See Kysar *Executive Summary*, *supra* note 1, at 411; Wirth, *supra* note 1, at 435–37.

<sup>5</sup> See Jasanoff, *Reason in Practice*, in JASANOFF, *SCIENCE AND PUBLIC REASON* 1, 1 (2012) (asserting that “issues that matter to publics have been prematurely taken out of politics” because of “the ascendancy of science and technology”).

<sup>6</sup> *Brown v. Bd. of Educ. (Brown I)*, 347 U.S. 483, 495 (1954) (declaring the fundamental principle that racial discrimination in public education is unconstitutional); *Brown v. Bd. of Educ. (Brown II)*; 349 U.S. 294, 301 (1955) (considering the question of relief and remanding the cases to the District Courts for proceedings and orders “as are necessary and proper to admit to public schools on a racially nondiscriminatory basis with all deliberate speed”).

times, relatively few people would argue that the Court went wrong in overruling this previous constitutional dogma.<sup>7</sup>

Freund told us that Justice Felix Frankfurter, distinguished jurist and noted anglophile, had his law clerks read poetry in the morning before they advised him on how to ground his decisions and how to word his opinions. As the Supreme Court confronted *Brown*, Justice Frankfurter was concerned at the prospect of undermining the *ex cathedra* quality of Supreme Court judgments and mindful of the Court's reluctance to overrule itself.<sup>8</sup> Even more acutely, he was concerned with the school districts' reaction after the Court ruled.<sup>9</sup> The "separate but equal" doctrine had existed for decades and its meaning was established in widespread practice.<sup>10</sup> Suddenly, the Court would order the schools to dispose of their racially segregated facilities and put people of different colors together, equally. Justice Frankfurter understood the importance of language in fashioning binding legal rules. He realized that the Court's opinion would need to be crafted so that people could clearly understand its intent and seriousness, but also have the necessary time to act upon the decision's mandate.<sup>11</sup> What language could convey the Court's firmness of purpose, and yet leave some flexibility in its execution?

The day the law clerks were advising Justice Frankfurter in wording the Court's opinion, they read *The Hound of Heaven*, written in 1893 by the English poet Frances Thompson.<sup>12</sup> Speaking in the first person, Thompson describes his dread as he flees the feet of the divine hound pursuing him.<sup>13</sup> The poem reads, in part:

A down Titanic glooms of chasmèd fears,  
From those strong Feet that followed, followed after.  
But with unhurrying chase,  
And unperturbèd pace,

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<sup>7</sup> See *History of Brown v. Board of Education, U.S. Cts.*, <http://www.uscourts.gov/EducationalResources/ConstitutionResources/LegalLandmarks/HistoryOfBrownVBoardOfEducation.aspx> (last visited May 14, 2013).

<sup>8</sup> See Charles J. Ogletree, Jr., *The Significance of Brown*, 20 HARV. BLACKLETTER L.J. 1, 6–7 (2004).

<sup>9</sup> See *id.*

<sup>10</sup> *Plessy v. Ferguson*, 163 U.S. 537, 540, 552 (1896); see Philip Elman & Norman Silber, *The Solicitor General's Office, Justice Frankfurter, and Civil Rights Litigation, 1946–1960: An Oral History*, 100 HARV. L. REV. 817, 822–23 (1987).

<sup>11</sup> See Elman & Silber, *supra* note 10, at 827–28.

<sup>12</sup> FRANCIS THOMPSON, *THE HOUND OF HEAVEN* (1893), reprinted in FRANCIS THOMPSON: POEMS AND ESSAYS 107–13 (Wilfred Meynell ed., The Newman Bookshop 1947) (1913).

<sup>13</sup> *Id.*

Deliberate speed, majestic instancy,  
 They beat—and a Voice beat  
 More instant than the Feet—  
 ‘All things betray thee, who betrayest Me.’<sup>14</sup>

The phrase that Justice Frankfurter’s clerks picked up from *The Hound of Heaven* was “deliberate speed.”<sup>15</sup> Frankfurter had already used that phrase in prior, less momentous opinions, probably deriving its use from Justice Oliver Wendell Holmes.<sup>16</sup> With his approval, those words became a defining point of the *Brown* decision and influenced how the ruling balanced practicality with the mandate for radical change.<sup>17</sup> In these multiple translations—from Justice Holmes to Justice Frankfurter, from Frances Thompson to Frankfurter’s law clerks, and from them via Chief Justice Earl Warren into one of the twentieth century’s most celebrated constitutional decisions—we see how the right bit of language can help to solve a very pragmatic problem: How do you make a radical rule change stick? *Brown* said schools must desegregate, but with deliberate speed, which allowed those affected by the decision sufficient time to think things through and take considered action.<sup>18</sup>

Having been born in India, a country colonized by the British from the nineteenth century until it gained independence in the middle of the twentieth, I have often reflected on the power of shared language in situations such as the one the Supreme Court faced in *Brown*. What had to happen to allow a consensus to form around a phrase like “deliberate speed”? Justice Frankfurter’s anglophilia had to inspire his law clerks’ readings of English poetry; and they had to grasp in their turn how poetic language might resonate strongly enough to change entrenched social expectations. A huge amount of prior cultural work, linguistic work, and conceptual work had to be done in order for the Court to find language compelling enough to forge a new constitutional consensus under conditions of conflict and uncertainty.

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<sup>14</sup> *Id.* at 107.

<sup>15</sup> *Brown II*, 349 U.S. at 301; see Jim Chen, *Poetic Justice*, 28 CARDOZO L. REV. 581, 591 (2006).

<sup>16</sup> Chen, *supra* note 15, at 586; see *First Iowa Hydro-Electric Coop. v. Fed. Power Comm’n*, 328 U.S. 152, 188 (1946) (Frankfurter, J., dissenting); *Virginia v. West Virginia*, 222 U.S. 17, 20 (1911). Years after Professor Freund relayed this story to his students, Philip Elman, a former law clerk to Justice Frankfurter, would tell the story slightly differently, making no mention of the law clerks having discovered the piece of language, but emphasizing the connection to Holmes. See Elman & Silber, *supra* note 10, at 829–30, 842–43.

<sup>17</sup> See Chen, *supra* note 15, at 591–92.

<sup>18</sup> See *Brown II*, 349 U.S. at 301.

## II. REALIGNING MORAL INTUITIONS WITH PROFESSIONAL DISCOURSE

Shifting focus to the contemporary world order, and to global environmental debates in particular, one must similarly ask what it would take to bring about a radical change in the way people have constructed unsustainable preferences. In addition, one must question the rationalization of these preferences, using highly technical discourses such as welfare economics, whose underlying normative presumptions remain resistant to wider questioning.<sup>19</sup> What would it take to ratchet open the closed discourse of welfare economics and completely reframe the discussion, using new terms with new normative implications?

Professors Kysar and Wirth have already suggested some of the things we can do. One choice is to take direct action by approaching the United Nations with a petition and making a case for action. Unfortunately, for a variety of reasons, we cannot expect this approach to succeed immediately in most cases. Of course, if our goal is to bring about a change in discourse—and an associated change in conceptual thought—then even the relatively small act of making an argument to the delegates of the United Nations may prove effective in the long term.<sup>20</sup> It puts an idea in circulation that may one day bear fruit, nourishing social action. Then, to draw from Professor Wirth's suggestions, we can look at existing spaces of deliberation to find glimmers of hope.<sup>21</sup> We can use those glimmers, in essence, to guide us in fertilization of a different sort—not ocean fertilizing with iron filings that create algal blooms<sup>22</sup>—but with words that encourage new ideas to bloom for the benefit of society at large.<sup>23</sup>

The barriers to facilitating such global rethinking are immense and must be challenged both individually and collectively by those who wish to reform the existing order. We must consider where the conceptual barriers to understanding lie—barriers of thought that prevent

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<sup>19</sup> See T.R. Hicks, *The Foundations of Welfare Economics*, 49 *ECON. J.* 696, 701 (1939) (defining “an optimum organisation of the economic system as one in which every individual is as well off as he can be made, subject to the condition that no reorganisation permitted shall make any individual worse off”).

<sup>20</sup> Cf. Nan D. Hunter, *Health Insurance Reform and Intimations of Citizenship*, 159 *U. PA. L. REV.* 1955, 1981 (2011) (asserting—in the health care context—that activists achieve their goals “in the opportunity created by the legislative debates and electoral campaigns to build public participation in the discourse of individual liberty as superior to collective obligation”).

<sup>21</sup> See Wirth, *supra* note 1, at 433–37.

<sup>22</sup> See *id.* at 417–18.

<sup>23</sup> See *id.* at 436–37.

people, for example, from unequivocally answering “yes” when asked whether existence should trump interests. Responses to tragic disasters such as the catastrophic 2004 Asian tsunami<sup>24</sup> and the 2011 Japanese earthquake, tsunami, and nuclear meltdown<sup>25</sup> suggest that prioritizing existence over self-interest enjoys wide, if tacit, acceptance. At those moments, we saw that the world actually *is* prepared to care about strangers, and to care across the boundaries of nation and culture.<sup>26</sup> One could look at those tragic events as community-building moments that evidence a kind of global constitutionalism that already exists in our world. Each of those disasters called forth an acknowledgement that we are all members of the same species; that obligations do not cease just because harm happens to fall on somebody else’s doorstep; and that money and aid must change hands because alleviating somebody else’s misery is worth more to us than preserving our own assets.

Thus, we see some counter-economic principles already at work at a global scale. They rise to view in moments of global crisis that draw out people’s empathy.<sup>27</sup> Therefore, to some extent, the barriers we need to identify and dismantle are ones created by ideologies and modes of reasoning that funnel our thinking and keep us from acting on these common sensibilities. Professor Kysar’s analysis of how welfare economics creates such narrowing is brilliant.<sup>28</sup> It follows that one way to move the discussion forward is to unpick the perverse analytic mantras that we have taught to generations of legal and policy analysts so that they *cannot* think in other terms, even when ethics and morality call for different ways of thinking.<sup>29</sup> The blocking routines of technical expertise are embedded in a variety of institutional practices. The following Parts focus on two such practices.

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<sup>24</sup> Amy Waldman, *Thousands Die as Quake-Spawmed Waves Crash onto Coastlines Across Southern Asia*, N.Y. TIMES, Dec. 27, 2004, at A1.

<sup>25</sup> Martin Fackler, *Powerful Quake and Tsunami Devastate Northern Japan*, N.Y. TIMES, Mar. 12, 2011, at A1.

<sup>26</sup> See Stephanie Stron, *U.S. Charity Overwhelmed by Disaster Aid*, N.Y. TIMES, Jan. 13, 2005, at A10; Malia Wollan, *Help from the U.S. for Afflicted Sister Cities in Japan*, N.Y. TIMES, Mar. 20, 2011, at A23.

<sup>27</sup> See Stron, *supra* note 26; Wollan, *supra* note 26.

<sup>28</sup> See Douglas A. Kysar, *Politics by Other Meanings: A Comment on “Retaking Rationality Two Years Later,”* 48 HOUS. L. REV. 43, 76 (2011).

<sup>29</sup> See Jasanoff, *supra* note 5 (explaining that because science and technology dominate, “democratic nations must reinvent their practices of governance in the interests of building more just, inclusive, and promissory futures”); Sheila Jasanoff, *The Songlines of Risk*, 8 ENVTL. VALUES 135, 150 (1999).

### III. THE IMPACT OF JURIDICAL INSTITUTIONS ON GLOBAL ENVIRONMENTAL CONSTITUTIONALISM

Deeply-embedded technical thinking within our legal and juridical institutions has adverse impacts on making necessary changes. For example, in *Massachusetts v. EPA*, a case that turned out “right” from the standpoint of climate policy, the Supreme Court conferred standing on the states in international environmental issues and held the EPA responsible for its failure to take action on climate change.<sup>30</sup> In dissent, however, Justice Scalia made a subtle argument about whose knowledge should hold legal weight in situations of scientific and legal uncertainty.<sup>31</sup>

Justice Scalia argued that law trumps when there is a contest of authority between science’s right to declare the state of the world and law’s right to declare *who* declares the scientific state of the world.<sup>32</sup> He invoked the Supreme Court’s precedent, which requires an administrative agency’s interpretation of the law to prevail in situations of legal ambiguity and uncertainty.<sup>33</sup> When Congress creates the law it cannot practically prescribe the details of administrative rulemaking.<sup>34</sup> Therefore, we *want* agencies to have discretion so that the legislature does not have to micro-manage everyday regulatory judgments.<sup>35</sup> In *Massachusetts v. EPA*, the EPA, according to Justice Scalia, quite properly construed its obligation to mean that under the Clean Air Act, air pollution does not refer to stratospheric conditions.<sup>36</sup> Justice Scalia opined that the Court does not have the authority to overrule the EPA when the agency decides that, under an *air pollution* control law, it does not have to regulate something affecting stratospheric conditions.<sup>37</sup>

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<sup>30</sup> 549 U.S. 497, 520–21, 531–32 (2007).

<sup>31</sup> *See id.* at 549–55 (Scalia, J., dissenting).

<sup>32</sup> *See id.* at 553.

<sup>33</sup> *See id.*; *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842–43 (1984).

<sup>34</sup> *See Chevron*, 467 U.S. at 865 (reasoning that when Congress does not legislate “on the level of specificity” to accommodate all circumstances, Congress may have “consciously desired the Administrator to strike the balance at this level, thinking that those with great expertise and charged with responsibility for administering the provision would be in a better position to do so”).

<sup>35</sup> *See id.* (holding that because agencies are politically accountable through the President, “an agency to which Congress has delegated policy-making responsibilities may, within the limits of that delegation, properly rely upon the incumbent administration’s views of wise policy to inform its judgments”).

<sup>36</sup> 549 U.S. at 559 (Scalia, J., dissenting).

<sup>37</sup> *Id.* at 560.

Implicit in that analysis, however, was also an assertion of national sovereignty. A second part of Justice Scalia's argument could be interpreted as saying that, even if world scientific authorities decide there is a supra-national problem out there, the United States government can still continue to administer our laws as written, even if doing so evades, or even contradicts, the global understanding.<sup>38</sup> This reasoning indicates how the use of legal precedents can erect significant barriers to acknowledging scientific evidence on problems of global scale.<sup>39</sup> In effect, Justice Scalia seemed to be saying that the very possibility of knowing something about the global environment—in this case, that the world is at risk from catastrophic climate change—only arises through national legal and administrative determinations,<sup>40</sup> because a regulatory agency such as the EPA is authorized to create valid public knowledge in accordance with procedures specified by its own governing administrative law, without concern for internationally accepted scientific determinations.<sup>41</sup> As it happened, Justice Scalia's analysis did not prevail in *Massachusetts v. EPA*, but there is a serious point to be drawn from his dissent nonetheless about the frictions that exist between national legal developments and the prospects for a meaningful global constitutionalism based on science.

Each society and government has learned how to hold its own administrative agencies accountable; despite imperfections and much cross-national variation, legal rules and processes exist for doing so in most democratic nations.<sup>42</sup> There is no agreement, however, on how to implement accountability at the global level. My own comparative research on technical decision-making in Great Britain, Germany, and the United States shows that the governments of these three countries handle scientific uncertainties in substantially different ways that sometimes lead to significantly different regulatory outcomes.<sup>43</sup> The variety

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<sup>38</sup> See *id.*

<sup>39</sup> See *id.* at 552–53 (criticizing the Supreme Court majority for straying from precedent and refusing to give deference to the EPA under the *Chevron* doctrine even though the “EPA's interpretation is not only reasonable, it is the most natural reading of the text”).

<sup>40</sup> See *id.* at 560 (“This is a straightforward administrative-law case, in which Congress has passed a malleable statute giving broad discretion, not to us but to an executive agency. No matter how important the underlying policy issues at stake, this Court has no business substituting its own desired outcome for the reasoned judgment of the responsible agency.”).

<sup>41</sup> See *id.*

<sup>42</sup> See Sheila Jasanoff, *Constitutional Moments in Governing Science and Technology*, 17 *SCI. & ENGINEERING ETHICS* 621, 630 (2011).

<sup>43</sup> Sheila Jasanoff, *Trading Uncertainties: The Transatlantic Divide in Regulating Biotechnology*, 6 *CESIFO DICE REP.*, no. 2, 36, 37–39 (2008); see also David Winickoff et al., *Adjudicat-*

of responses to the “Climategate”<sup>44</sup> controversy provides an example of this phenomenon. In the United States, after the University of East Anglia emails were hacked and published in November 2009, survey data showed that “climate denialists” seemed to get a significant boost and more people turned skeptical for a time.<sup>45</sup> Climate denialism in Great Britain saw a similar boost.<sup>46</sup> In Germany, however, there was no comparable shift in public opinion.<sup>47</sup> This suggests that global environmental expertise enjoys different levels of credibility in different nations, depending in part on the mechanisms in place for addressing uncertainty and building political consensus. Those mechanisms include the make-up and role of expert advisory committees and the ways that these bodies interact with legislatures, the executive branch, and the public, for example, through balance and disclosure requirements.<sup>48</sup> Because of these differences, the same scientific claims may not have the same impacts on policy in different nations or cultures. Therefore, even Western industrial nations, despite their many political similarities and common interests, do not produce shared understandings about the state of the world. Until nations consistently approach uncertainty, they will remain unable to develop common normative principles on the basis of which their citizens will claim stewardship for the planet and for future generations.

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*ing the GM Food Wars: Science, Risk, and Democracy in World Trade Law*, 30 YALE J. INT’L L. 81, 88, 100–01 (2005).

<sup>44</sup> Andrew C. Revkin, *Hacked E-Mail Data Prompts Calls for Changes in Climate Research*, N.Y. TIMES, Nov. 28, 2009, at A8. Climategate refers to the 2009 leak of hacked emails between a small group of climatologists studying global warming. *Id.* The emails revealed possible attempts to cover up scientific evidence and withhold certain data from public scrutiny. *Id.*

<sup>45</sup> See Frank Newport, *Americans’ Global Warming Concerns Continue to Drop*, GALLUP (Mar. 11, 2010), <http://www.gallup.com/poll/126560/Americans-Global-Warming-Concerns-Continue-Drop.aspx?version#2>.

<sup>46</sup> See Randeep Ramesh, *Public Support for Tackling Climate Change Declines Dramatically*, GUARDIAN (London) (Dec. 6, 2011), <http://www.guardian.co.uk/environment/2011/dec/07/public-support-climate-change-declines>.

<sup>47</sup> *It Runs in the Family*, HARV. MAGAZINE, July 30, 2010, <http://harvardmagazine.com/2010/07/jasanoff-family-at-harvard>.

<sup>48</sup> See Sheila Jasanoff, *Judgment Under Siege: The Three-Body Problem of Expert Legitimacy*, in SOCIOLOGY OF THE SCIENCES: DEMOCRATIZATION OF EXPERTISE? EXPLORING NOVEL FORMS OF SCIENTIFIC ADVICE IN POLITICAL DECISION-MAKING 209, 211–12, 217–19 (Peter Weingart & Sabine Maasen eds., 2005).

#### IV. THE “PRECAUTIONARY PRINCIPLE” AND GLOBAL ENVIRONMENTAL CONSTITUTIONALISM

Deeply embedded institutional practices also affect our methods of responding to the incompleteness of information on climate change. Professor Wirth discussed the “Precautionary Principle” or the “Precautionary Approach” to decision-making under conditions of uncertainty.<sup>49</sup> I agree that this is a productive field of thought, and one that should be further discussed and developed by scholars and policymakers. There are, however, different ways in which the world seems to think about “precaution” at this moment.<sup>50</sup> From the standpoint of global constitutionalism, I see one of these ways as productive and the other as potentially detrimental.

The first precautionary approach is to create a common administrative framework for dealing with uncertainty, and to include within that framework multiple viewpoints and attitudes toward safeguarding the future.<sup>51</sup> For this approach, an important prototype is the Intergovernmental Panel on Climate Change (“IPCC”).<sup>52</sup> Although the IPCC has its critics,<sup>53</sup> it is an institution promoting global environmental constitutionalism through both scientific and participatory means at a time when such institutions are sadly lacking.

The IPCC began with a fairly rigid idea of who may speak for science in the global arena. During the preparation of the First Assessment Report, peer review was an ad hoc process, conducted without formal guidelines, and largely followed traditional scientific norms in the selection of peers.<sup>54</sup> After the release of that Report, however, the

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<sup>49</sup> See David A. Wirth, *Precaution in International Environmental Policy and United States Law and Practice*, 10 N. AM. ENVTL. L. & POL’Y 221, 226 (2003) (examining “the role of regulatory philosophy of precautionary decision making in the United States law and policy”); Wirth, *supra* note 1, at 435–36.

<sup>50</sup> See *infra* notes 51–71 and accompanying text (describing two competing interpretations of the precautionary approach).

<sup>51</sup> See John S. Applegate, *The Taming of the Precautionary Principle*, 27 WM. & MARY ENVTL. L. & POL’Y REV. 13, 17–20 (2002) (breaking down into elements various formulations of the precautionary principle).

<sup>52</sup> The IPCC “is the leading international body for the assessment of climate change. It was established . . . to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts.” *Organization*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, [www.ipcc.ch/organization/organization.shtml#UU8w\\*BzCaSo](http://www.ipcc.ch/organization/organization.shtml#UU8w*BzCaSo) (last visited May 14, 2013).

<sup>53</sup> Mike Hulme et al., *IPCC: Cherish It, Tweak It or Scrap It?*, 463 NATURE 730, 730 (2010) (featuring multiple reviews of the IPCC, including Hulme’s opinion that the panel should be dissolved).

<sup>54</sup> See, e.g., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE: THE IPCC SCIENTIFIC ASSESSMENT, at app. 4 (1990) (listing the reviewers of the IPCC Working

IPCC broadened the range of people invited to introduce their knowledge into the assessment process.<sup>55</sup> Recognizing the need for political and scientific credibility, the IPCC decided to seek more consistent review by several different classes of experts: “specialists with significant publications in particular areas, experts named in IPCC ‘master lists’ based on information supplied by various governments and organizations, and specialist reviewers nominated by international organizations including those in the United Nations system, The World Bank, Third World Academy of Sciences,” and the Organisation for Economic Cooperation and Development.<sup>56</sup> The IPCC also intensified its efforts to seek participation by developing country experts, for example, by funding their trips to meetings and requiring their inclusion as lead authors.<sup>57</sup> Thus, in the IPCC’s successive reports,<sup>58</sup> there is not only a reduction of expert uncertainty about how the climate is changing, but also a simultaneous co-production of a new international democracy of knowledge-making.<sup>59</sup> In this procedural evolution, more communities are being encouraged to participate and present their knowledge and perspectives, regardless of their scientific, political, or administrative legal cultures.<sup>60</sup> This represents a positive step toward greater inclusion and a more comprehensive global dialog on precaution.

There is, regrettably, a second approach to precaution that is less hospitable to broad political representation and to the concerns of non-experts. This approach is grounded in a kind of backlash against participatory democracy that I see coming from the policy analytic world. It tends to undercut the more positive developments observable in the IPCC. The counter-movement derives from a somewhat unexpected alliance between the fields of behavioral economics, policy analysis, and democracy theory.

Influential recent work in behavioral economics and social psychology suggests that people do not behave in an economically rational

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Group I report), *available at* [http://www.ipcc.ch/ipccreports/far/wg\\_I/ipcc\\_far\\_wg\\_I\\_app\\_04.pdf](http://www.ipcc.ch/ipccreports/far/wg_I/ipcc_far_wg_I_app_04.pdf).

<sup>55</sup> See Mike Hulme, *The IPCC on Trial: Experimentation Continues*, ENVTL. RES. WEB (July 21, 2010), <http://environmentalresearchweb.org/cws/article/opinion/43250>.

<sup>56</sup> Shardul Agrawala, *Structural and Process History of the Intergovernmental Panel on Climate Change*, 39 CLIMATIC CHANGE 621, 626 (1998).

<sup>57</sup> *Id.* at 629–30.

<sup>58</sup> The IPCC’s four assessment reports are all available online at [http://www.ipcc.ch/publications\\_and\\_data/publications\\_and\\_data\\_reports.shtml#UZEa6LXgOuL](http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#UZEa6LXgOuL) (last visited May 14, 2013).

<sup>59</sup> See Wimickoff et al., *supra* note 43, at 115 n.169.

<sup>60</sup> See Agrawala, *supra* note 56, at 623–32.

manner when they are put in experimental situations.<sup>61</sup> Consistent with Professor Kysar's argument, however, there is a rather limited notion of rationality that underpins this work.<sup>62</sup> Rationality is often tied exclusively to the ways in which people assess mathematical probabilities of gain and loss from expenditures of money.<sup>63</sup> If, for example, the experimental subject is given one dollar and asked to save that money or spend it for a stated purpose, the subject's choice should remain the same whether the choices are described in terms of "losses" or "gains." Experimental results show, however, that people are routinely more inclined to take a risk when the choice is presented in terms of a potential *gain* rather than a potential *loss*.<sup>64</sup> This failure to respond in the same way to the same likelihood of winning or losing is thought to be irrational.<sup>65</sup>

This recent economic research has constructed, in essence, a powerful image of human beings as fundamentally irrational—as agents who come into every situation with biases that get in the way of clear thinking and correct choice. From this perspective, the precautionary approach looks like an irrational idea, based on blinders in the brain that prevent us from seeing the state of the world as it actually is. One of these blinders causes us to overvalue the things we have now more than the things that we are promised in the future,<sup>66</sup> even when those future gains outweigh the resources of the present. Professor Kysar's point that we should value the present state of the world with its biodiversity over a future state in which we do not have the same biodiversity might well be written off by these researchers as irrational.<sup>67</sup> Perhaps we would be better off, from this viewpoint, not with the species that currently populate the Earth but rather with gene banks from which we could constitute in the future an infinite array of known and unknown species. Why, after all, should we settle for the haphazard assortment of species that we have inherited through the accidents of evolution when

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<sup>61</sup> See Amos Tversky & Daniel Kahneman, *Rational Choice and the Framing of Decisions*, 59 J. BUS. 251, 272 (1986).

<sup>62</sup> See Douglas A. Kysar, *Climate Change, Cultural Transformation, and Comprehensive Rationality*, 31 B.C. ENVTL. AFF. L. REV. 555, 565–66 (2004).

<sup>63</sup> See, e.g., Tversky & Kahneman, *supra* note 61, at 258 (listing multiple studies that reach a similar definition of economically rational behavior).

<sup>64</sup> *Id.* at 258–60.

<sup>65</sup> *Id.* at 253.

<sup>66</sup> See generally Amos Tversky & Daniel Kahneman, *Loss Aversion and Riskless Choice: A Reference-Dependent Model*, 106 Q. J. ECON. 1039 (1991) (discussing loss aversion and the relative strength of current possession over prospective possession).

<sup>67</sup> See Kysar *Executive Summary*, *supra* note 1, at 411.

science in the future might offer us different, more varied worlds? If precaution tends to prefer the status quo, then—on this reasoning—precaution should be rejected as a backward-gazing policy that does not do justice to our capacity to remake the world and to make it better.

The problem with such thinking is that it substitutes the wisdom of experts for the wisdom of all of society.<sup>68</sup> In the field of innovation studies, it is customary to speak of “convergent technologies,” that is, different technological systems that interact synergistically to produce new goods for society.<sup>69</sup> I see behavioral economics, social psychology, risk analysis, and public policy as powerful convergent technologies of reason, which through their synergy aim to characterize humans more accurately rather than to better serve our moral intuitions. This movement offers a strong counter-force against the IPCC’s moves toward greater democratization of global environmental knowledge, because, in effect, these descriptive scientists are de-skilling those outside their fields by depreciating their very capacity to understand and assess risks responsibly.<sup>70</sup> On the subject of rationality, the experts might say that critiques like Professor Kysar’s do not really make much sense because they are driven by biases toward conservatism and a mistaken valuation of the present in relation to the future. Such experts might further assert that, because most people do not recognize their own biases, the work of projecting and realizing alternative futures should be left to the specialists who master the right technologies of rationality.<sup>71</sup> They will tell us how to make organized, understandable, collective judgments about our common future. Then indeed we will have a form of global constitutionalism, but it will be based on experts’ reasoning and not on ours.

#### CONCLUSION

Global environmental constitutionalism, I have suggested, should not be seen exclusively as a problem for international law or international relations theory, though the participation of these disciplines is essential. To make progress, we need to recognize other ways in which the foundations for constitutionalism are being laid, albeit in forms that legal analysis tends not to take into account. Science and expertise,

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<sup>68</sup> See Jasanoff, *supra* note 48, at 154–55.

<sup>69</sup> J.O. Olawuyi & Friday Mgbale, *Technological Convergence*, 2012 SCI. J. PHYSICS, at 1.

<sup>70</sup> See Cass R. Sunstein, *Beyond the Precautionary Principle*, 151 U. PA. L. REV. 1003, 1036 (2003) (suggesting the failures of the precautionary approach are better understood through the lenses of behavioral economics and cognitive psychology).

<sup>71</sup> See Jasanoff, *supra* note 29, at 145.

in particular, operate as powerful drivers of collective thinking about environmental governance, but their role is neither transparent nor necessarily consistent with democratic norms. Expert institutions such as the IPCC can play a valuable role as sites of learning where diverse modes of global knowledge-making and diverse experiments in participatory decision-making are worked out together. These experiments, however, may flounder if what I call the convergent technologies of rationality persist in representing human minds as irrationally fearful and incapable of making well-considered decisions about when to lean toward precaution and when to opt for novel futures.

Law, like science, can either facilitate or inhibit creative thinking about a global constitutional order. My story about *Brown v. Board of Education* illustrates the power of legal discourse to move people, helping to translate widely held moral intuitions—those reflected in altruistic responses to environmental disasters for example—into robust principles of constitutional governance. Rigid legalistic thinking, however, can undermine the processes of global agenda-setting, especially if judges elevate concerns for national sovereignty above the need for collective action at the global level, as Justice Scalia arguably did in his dissent in *Massachusetts v. EPA*. Science and law, finally, are both human institutions, human in their frailty but human also in their inbuilt capacity for change. In a time of mounting concern about our threatened future, it is well to remember that the institutions we have built are meant to serve us, and not forget that neither scientific nor legal expertise sits beyond questioning or beyond reform.