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Pandemic as Transboundary Harm: Lessons from the *Trail Smelter Arbitration*

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PANDEMIC AS TRANSBOUNDARY HARM: LESSONS FROM THE *TRAIL SMELTER ARBITRATION*

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The COVID-19 pandemic has caused incalculable harm around the world. The fact that this immense harm can be traced back to a localized outbreak in or near Wuhan, China, raises questions about the responsibility China might bear for the pandemic under public international law. Famously applied in the seminal Trail Smelter Arbitration *(1938/1941), the Transboundary Harm Principle provides that no state can use or allow the use of its territory in a manner that causes significant harm in the territory of other states. This article does not intend to tap into the unseemly, xenophobic spirit that animates much of the rhetoric blaming China for the pandemic. Yet, if regulatory failure in China caused the pandemic, then those acts or omissions might qualify as a violation of the customary international law Transboundary Harm Principle. This Principle, which seeks to preserve states' fundamental right to sovereignty while accommodating a spectrum of interstate or transboundary interaction, has become a foundational component of international environmental law. But at its core, the Transboundary Harm Principle establishes the risk of international law responsibility for harm caused by domestic regulatory failure. This article demonstrates the Principle's application beyond environmental law and further applies it to the COVID-19 pandemic. The* Trail Smelter Arbitration *both articulated the relevant substantive law and also provided a model for fashioning an equitable remedy for violations of the Principle. That remedy accounts for harmed states' contribution to the severity of the harm suffered. This framework—consisting of the* Trail Smelter Arbitration*'s substantive law and remedial procedure—confirms that the Transboundary Harm Principle is an appropriate international law solution to the question of China's responsibility for the harm caused by COVID-19.*

* J.B. Stombock Professor of Law, Washington & Lee University. This article builds on research done in preparation for my testimony on these issues before the United States Senate Judiciary Committee. *See* The Foreign Sovereign Immunities Act, Coronavirus, and Addressing China's Culpability Before the S. Jud. Comm., 116th Cong. (2020), https://www.judiciary.senate.gov/meetings/the-foreign-sovereign-immunities-act-coronavirus-and-addressing-chinas-culpability [https://perma.cc/T8EU-6GJQ] (Testimony of Russell Miller, J.B. Stombock Professor of Law, Washington & Lee University). I want to thank Ryan Moore (W&L Law 2023) for tireless and professional research support.

I. Introduction

As the COVID-19 pandemic rumbled past its third anniversary, the ever-mounting costs and consequences of the crisis seem to have surpassed tangible meaning. They have become weighty, abstract metaphors for the ill that has befallen us. The number of afflicted, the loss of life, the extent of social and emotional hardship, and the economic disruption involve numbers similar to those that try, but fail, to capture the gravity of the world's worst wars. The COVID-19 pandemic has caused over six hundred million confirmed cases of infection;[1]

1. WHO Coronavirus (COVID-19) Dashboard (visited Nov. 20, 2022), https://covid19.who.int/ [https://perma.cc/5P35-AJ4R].

perhaps as many as twenty million deaths;[2] and many trillions of dollars in redirected or lost economic resources.[3]

On this scale, practically touching everyone alive in one way or another, it is easy to regard the pandemic as something vast and amorphous. But doing so neglects the simple, straightforward, and uncontestable fact that the pandemic had a distinct origin.[4] Generalizing and globalizing the crisis diminishes the urgent need to study and learn about its causes to help us in the present, ongoing struggle against COVID-19, and to help us prevent and prepare for future outbreaks. This widespread misdirection also obscures the question of responsibility. The scientific, health-policy, and legal significance of responsibility for the pandemic was burdened by the crude, rhetorical blame-gaming of the Trump Administration.[5] At its least offensive, that posture sought to distract from the inadequacies in the U.S. response to the crisis. At its most offensive, the Trump Administration's posture was xenophobic.[6]

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2. David Adam, *The Pandemic's True Death Toll: Millions More than Official Counts*, NATURE (Jan. 18, 2022), https://www.nature.com/articles/d41586-022-00104-8/ [https://perma.cc/66CP-4ZQR] ("*The Economist* magazine in London has used a machine-learning approach to pro-duce an estimate of 12 million to 22 million excess deaths – or between 2 and 4 times the pandemic's official toll" as of November 2021).

3. *See* JAMES K. JACKSON ET AL., CONG. RSCH. SERV., R46270, GLOBAL ECONOMIC EFFECTS OF COVID-19 (2021) (examining various metrics for estimating the financial costs of COVID-19).

4. There are several theories about the origin of the COVID-19 Coronavirus, but the most prominent theories assume that the outbreak began in Wuhan, China. *E.g.*, Smriti Mallapaty, *Where did COVID Come From? Five Mysteries that Remain*, NATURE (Feb. 26, 2021), https://www.nature.com/articles/d41586-021-00502-4 [https://perma.cc/PLG5-L6NW]. There have been some claims about a possible origin for the pandemic outside China. But that speculation would only shift the locus of these issues and does not call into doubt the conclusion that international law principles are implicated by the emergence of a border-transcending pandemic within the territory of a state.

5. Katie Rogers et al., *Trump Defends Using 'Chinese Virus' Label, Ignoring Growing Criticism*, N.Y. TIMES (Mar. 18, 2020), https://www.nytimes.com/2020/03/18/us/politics/china-virus.html/ [https://perma.cc/5HZ5-7RHY].

6. Quint Forgey, *Trump on 'Chinese virus' label: 'It's not racist at all'*, POLITICO (Mar. 18, 2020), https://www.politico.com/news/2020/03/18/trump-pandemic-drumbeat-coronavirus-135392/; [https://perma.cc/3L6W-YASH]; Mishal Reja, *Trump's 'Chinese Virus' tweet helped lead to rise in racist anti-Asian Twitter content: Study*, ABC NEWS (Mar. 18, 2021), https://abcnews.go.com/

But stripped of those unseemly qualities, and in recognition of the enormity of the harm done by the pandemic, it is reasonable to wonder whether China bears some responsibility for the pandemic under international law.[7]

To be perfectly clear, this article rejects the ugly sentiments or base politics that have dogged the issue of the pandemic's cause and any resulting legal responsibility. It merely seeks to apply well-settled public international law doctrine to one of the major global crises of the age. In any case, it would be unfortunate if, out of disdain for the intent and tone of some contributions to this debate, we neglected to consider whether public international law has something to say about this deadly and costly global calamity.[8]

Health/trumps-chinese-virus-tweet-helped-lead-rise-racist/story?id=76530148/ [https://perma.cc/CN9R-N2FD].

7. Scholars and commentators around the world have been debating this important question. *See* Russell Miller & William Starshak, *China's Responsibility for the Global Pandemic*, JUST SECURITY (Mar. 31, 2020), www.justsecurity.org/69398/chinas-responsibility-for-the-global-pandemic/ [https://perma.cc/28F5-ANDY]; Peter Tzeng, *Taking China to the International Court of Justice over COVID-19*, EJIL: TALK! (Apr. 2, 2020), www.ejiltalk.org/taking-china-to-the-international-court-of-justice-over-covid-19/ [https://perma.cc/9WAX-M6JE]; David Fidler, *COVID-19 and International Law: Must China Compensate Countries for the Damage?*, JUST SEC. (Mar. 27, 2020), www.justsecurity.org/69394/covid-19-and-international-law-must-china-compensate-countries-for-the-damage-international-health-regulations/ [https://perma.cc/LR55-7NNU]; Lewis Libby & Logan A. Rank, *To Protect the Future, Hold China to Account*, NATIONAL REVIEW (Mar. 21, 2020), www.nationalreview.com/2020/03/coronavirus-pandemic-hold-china-accountable/#slide-1>; Devashish Giri, *Responsibility of China for the Spread of Covid-19: Can China Be Asked to Make Reparations?*, JURIST (Apr. 10, 2020), www.jurist.org/commentary/2020/04/devashsish-giri-china-covid19-reparations/ [https://perma.cc/8TUG-2MS2]. *But see* Sophie Capicchiano Young, *State Responsibility for COVID-19: Does International Contagion Constitute Transboundary Harm?*, 11 ASIAN J. INT'L L. 372 (2021); Chimène Keitner, *Don't Bother Suing China for Coronavirus*, JUST SECURITY (Mar. 31, 2020), www.justsecurity.org/69460/ [https://perma.cc/9EP8-KQF8] (both questioning the potential liability of China in international law and the practicability of seeking remediation for the COVID-19 pandemic).

8. It is tempting to characterize the COVID-19 pandemic as the deadliest and most costly calamity of the last half-century. But, in fact, the HIV/AIDS pandemic is estimated to have taken the lives of 40.1 million since the early 1980s. UNAIDS, GLOBAL HIV & AIDS STATISTICS — FACT SHEET (visited Oct. 7, 2022), https://www.unaids.org/en/resources/fact-sheet [https://perma.cc/9DNL-PHZ6]. COVID-19 doesn't yet compare. Even factoring in underreporting, COVID-19 fatalities are "only" around 28.5 million. *See The*

In fact, public international law has a lot to say about the pandemic, including at least one theory for attributing international law responsibility to China for the COVID-19 crisis.[9] This article argues that the well-settled customary norm, often referred to as the Transboundary Harm Principle (the Principle), establishes a proportional framework for assessing and assigning international law responsibility for the pandemic's harm while accounting for states' mostly-desirable, ever-deepening interrelation, interdependence, and integration. The most famous articulation and application of the Principle—the seminal, precedent-setting *Trail Smelter Arbitration*[10] between the United States and Canada—offers a useful case-study for the definition and application of the Principle's key elements to the COVID-19 pandemic.

Of course, public international law is mostly a self-enforcing regime. In most instances, there is no centralized or inde-

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Pandemic's True Death Toll, THE ECONOMIST (updated Jan. 24, 2023), https://www.economist.com/graphic-detail/coronavirus-excess-deaths-estimates [https://perma.cc/7ME7-ZDZT].

9. The American Journal of International Law published an Agora on the subject "The International Legal Order and the Global Pandemic." The collection featured fifteen essays, including Curtis Bradley's and Laurence Helfer's introduction. Curtis A. Bradley & Laurence R. Helfer, *Introduction to "The International Legal Order and the Global Pandemic,"* 114 AM. J. INT'L L. 571–77 (2020). For further examples of such writings, see Oona A. Hathaway et al., *The COVID-19 Pandemic and International Law*, 54 CORNELL INT'L L.J. (2021); Russell Buchan et al., *International Law in a Time of Pandemic*, 11 J. INT'L HUMANITARIAN LEGAL STUD. 187 (2020); EPIDEMICS AND INTERNATIONAL LAW (Shinya Murase & Suzanne Zhou eds., 2021); Pedro Villarreal, *Pandemic: Building a Legal Concept for the Future*, 20 WASHINGTON UNIV. GLOB. STUD. L. REV. 611 (2021); Armin von Bogdandy & Pedro Villarreal, International Law on Pandemic Response: A First Stocktaking in Light of the Coronavirus Crisis, Max Planck Institute for Comparative Public Law & International Law (MPIL) Research Paper No. 2020-07 (Mar. 26, 2020); Armin von Bogdandy & Pedro A. Villarreal, *The Role of International Law in Vaccinating Against COVID-19: Appraising the COVAX Initiative*, 81 ZEITSCHRIFT FÜR AUSL. . .NDISCHES ÖFFENTLICHES RECHT UND VÖLKERRECHT/HEIDELBERG J. INT'L L. 89 (2021). Additionally, there has been some consideration of the possible application of the Transboundary Harm Principle to the pandemic. Young, *supra* note 7, at 373.

10. Trail Smelter (U.S. v. Can.), 3 R.I.A.A. 1905 (1938); Trail Smelter (U.S. v. Can.), 3 R.I.A.A. 1938 (1941). In common parlance, both proceedings are referred to either as *Trail Smelter* case or *Trail Smelter Arbitration*. We will refer to the 1938 proceedings in the footnote text as "*Trail Smelter I*" and the 1941 proceedings as "*Trail Smelter II*."

pendent authority exercising automatic jurisdiction for invoking, prosecuting, adjudicating, and enforcing violations of the "rules and principles of general application dealing with the conduct of states and of international organizations and with their relations *inter se*."[11] States are responsible for exercising their sovereign right to assert, or disregard, their legal interests. Maybe the international community will decide to take the pandemic as it is, to confront the challenges that containing and curing the disease raise without looking back in condemnation. That would be states' prerogative. But, if they seek to consider the legal consequences for the state in which the pandemic originated, then the Transboundary Harm Principle provides one means for doing so.

This article presents the pandemic as a transboundary harm. It begins with a summary of the Transboundary Harm Principle's most prominent articulation in the *Trail Smelter Arbitration* nearly a century ago. Next, it introduces the updated jurisprudence of transboundary harm, including its potential for application to acts or omissions not involving environmental damage. This extends the Transboundary Harm Principle to cases in which clear-and-convincing evidence establishes that activity in the territory of one state caused a harm of serious consequence in another state. The *Trail Smelter Arbitration* provides productive insight into the interpretation and application of the elements of that customary international law norm. The case also provides a model for fashioning an equitable remedy that accounts for harmed states' contribution to the severity of the harm suffered. With frequent references to the *Trail Smelter* case, this article examines each of the Transboundary Harm Principle's elements and considers the Principle's possible application to the COVID-19 pandemic. Perhaps the most important insight to be drawn is that the Transboundary Harm Principle provides a cautious and proportional regime for assigning responsibility for border-transcending harm.

While this article argues that the Transboundary Harm Principle applies to the case of the COVID-19 pandemic, it does not seek to establish and assess the facts needed to determine whether the COVID-19 pandemic represents a violation

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11. RESTATEMENT (THIRD) OF THE FOREIGN RELS. L. OF THE U.S. § 101 (AM. L. INST. 1987).

of the rule. That vast and complex endeavor must be pursued by the states involved in a potential assertion of the Principle, perhaps according to a process similar to the one used in the *Trail Smelter Arbitration.*

II. THE *TRAIL SMELTER ARBITRATION* AND THE CONTEMPORARY TRANSBOUNDARY HARM PRINCIPLE

Sovereign states remain the central feature of the global order, of bilateral and multilateral cooperation, and of public international law.[12] States and their sovereignty are enshrined among the foundational principles of the United Nations Charter, which ensures the "sovereign equality" of all U.N. Member States.[13] The U.N. Charter codifies the *jus cogens* principles of non-intervention and territorial integrity, which are enjoyed by states as the fundamental pillars of sovereignty.[14] The International Court of Justice, in the *Nicaragua* case, explained that "the principle of non-intervention involves the right of every sovereign State to conduct its affairs without outside interference."[15]

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12. In public international law the term "state" refers to the territorial and political entity we sometimes also call a "country." Presently there are 193 member states of the United Nations. As used in this statement, for example, the term "state" applies to the United States of America and the People's Republic of China. Interactions between states might be referred to as "interstate" or "international." This use of the term "state" should not be confused with the American use of the term "state" to refer to the fifty separate sub-sovereign political units that form the Union.

13. U.N. Charter art 2, ¶ 1.

14. *See* Maziar Jamnejad & Michael Wood, *The Principle of Non-intervention*, 22 LEIDEN J. INT'L L. 345, 346, 359 (2009) (exploring the non-intervention aspects of U.N. Charter art. 2, ¶ 4 and establishing territorial integrity as a corollary of it); JOSEPHAT CHUKWUEMEKA EZENWAJIAKU, STATE TERRITORY AND INTERNATIONAL LAW 81-82 (2021) (looking at the *jus cogens* nature of U.N. Charter art. 2, ¶ 4).

15. Military and Paramilitary Activities in and Against Nicaragua (Nicar. v. U.S.), Judgment, 1986 I.C.J. Rep. 14, ¶ 202 (June 27). The *Nicaragua* case involved allegations that the United States' anti-communist campaign against the Sandinista government in the 1980s violated Nicaragua's international law rights to non-intervention and territorial integrity. The United States did not participate in the proceedings on the merits of the allegations. The International Court of Justice ruled that the United States breached its obligations under customary international law not to use force against another state, not to intervene in another state's affairs, not to violate another state's sovereignty, and not to interrupt peaceful maritime commerce. This is a reminder that the international law claims described in this statement

Despite the sovereign autonomy enjoyed by states, the current global reality involves increasing transnational interaction amongst states whose behavior and cooperation transcends international boundaries. The doctrine addressing "transboundary harm" is one mechanism international law has found for managing that reality and the inevitable tension between states' stubborn interest in sovereignty, on the one hand, and their deepening interactions and interrelationships, on the other hand.[16] The doctrine answers the question: what are the consequences if activity occurring within the ambit of one state's territorial sovereignty causes harm across a border in the sovereign territory of another state? It is a confounding scenario because, in these situations, both states can invoke their entrenched right to sovereignty. One state claims the right to use its territory as it wishes, while the other claims the right to be free from another state's intrusion or interference.

A. *Background – Trail Smelter Arbitration*

The transboundary harm problem found its most prominent answer in the decisions of the *Trail Smelter Arbitration.*[17]

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are universally applicable, including as standards for the conduct of the government of the United States. *See* Efthymios Papastavridis, *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), 1986*, *in* LATIN AMERICA AND THE INTERNATIONAL COURT OF JUSTICE 211 (Jean-Marc Sorel & Paula Wojcikiewicz Almeida eds., 2017) (analyzing the *dicta* in the *Nicaragua* case as it pertains to current discussions of intervention in armed conflicts and the use of force); MAX HILAIRE, INTERNATIONAL LAW AND THE UNITED STATES MILITARY INTERVENTION IN THE WESTERN HEMISPHERE (1997) (exploring the United States' ties to international law as related to the *Nicaragua* case and generally).

16. *See* Ronald A. Brand, *Sovereignty: The State, the Individual, and the International Legal System in the Twenty First Century,* 25 HASTINGS INT'L & COMPAR. L. REV. 279, 284-85 (2002) (exploring how states interest as "supreme power" in their territory easily creates conflict with the requirements that being part of an international order requires).

17. Resort to the *Trail Smelter* judgements is justified because they are such a valuable articulation and illustration of the customary international law norm. *Trail Smelter I* (U.S. v. Can.), 3 R.I.A.A. 1905 (1938); *Trail Smelter II* (U.S. v. Can.), 3 R.I.A.A. 1938 (1941). It's confusing to see the case referred to as (and criticized as weak) precedent. Young, *supra* note 7, at 375–77. After all, caselaw remains only a "subsidiary" source of international law. Statute of the International Court of Justice, art. 38, ¶ 1, June 26, 1945. For that reason, the *Trail Smelter* case should not be offered as the source of, or the precedential origin of, the controlling Transboundary Harm Principle.

The *Trail Smelter* case arose out of complaints from American farmers in the depression-era Rocky Mountains who suspected that pollution arising from a massive zinc smelter in Trail, British Columbia was drifting over the Canadian border into northeastern Washington, causing crop damage and diminished timber.[18] When their attempts to obtain damages through civil lawsuits were obstructed by jurisdictional issues, the farmers turned to their congressional delegation for help.[19] The U.S. government took up the cause, asserting Canada's international law responsibility for the harm and demanding remedies.[20] Canada stood in for the smelting company and agreed to resolve the dispute through international arbitration.[21]

The arbitrators considered three factual and legal issues: 1) had the Trail Smelter caused harm in the United States?; 2) if the Trail Smelter had indeed caused harm in the United States, then was that a violation of international law?; and 3) if the harm caused by the Trail Smelter in the United States was a violation of international law, then what remedies were owed to the United States?[22] It took the arbitrators years of fact-finding and legal analysis—and two judgments—to settle the matter.[23] They found that the Trail Smelter (with Canada standing in as the smelting company's legal proxy) caused harm to

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Instead, the Principle is a customary international law rule. That means that, while immensely instructive and illustrative, the *Trail Smelter* case is not the decisive framing of the rule, which is not bound within parameters of the case as "precedent."

18. *Trail Smelter I*, 3 R.I.A.A. at 1913 (exploring the historic background of the Trail Smelter dispute).

19. John W. Wirth, *The Trail Smelter Dispute: Canadians and Americans Confront Transboundary Pollution, 1927-41*, 1 ENV'T HIST. 34, 35 (Apr. 1996) (telling the rationale behind the 1927 decision of American farmers to petition their state and federal representatives for assistance).

20. *See Trail Smelter II*, 3 R.I.A.A. at 1949 (noting that the $78,000 indemnity found by the 1938 decision was paid by the 1941 decision).

21. *See Trail Smelter I*, 3 R.I.A.A. at 1918 (exploring the referral of Canada, alongside the United States, to the International Joint Commission in an initial attempt to resolve the matter).

22. *Id.* at 1908 (noting the questions set forth in Article III of the 1935 agreement).

23. Wirth, *supra* note 19, at 35–36 (exploring the timeline of the two decisions and the research that both the United States and Canada promoted to achieve their ends).

crops and timber in the United States.[24] The arbitrators then announced the groundbreaking legal rule that has come to be known as the Trail Smelter Rule and which now serves more generally as the Transboundary Harm Principle:

> [N]o State has the right to use or permit the use of its territory in such a manner as to cause injury . . . to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.[25]

Finally, applying the newly-articulated international law rule, the arbitrators confirmed Canada's international law responsibility (which Canada had conceded) for the harm done to American interests in the state of Washington.[26] Canada was ordered to mitigate the harm and to pay compensation.[27] The former remedy was to be achieved through a jointly-monitored pollution abatement regime at the Trail Smelter.[28] The aim of this regime was to allow the mill to continue operating while substantially reducing its harmful emissions.[29] The latter remedy was secured by an order that Canada pay compensation for the harm the smelter had done in the United States.[30] Both of these remedies required extensive fact-finding, includ-

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24. *Trail Smelter I*, 3 R.I.A.A. at 1926, 1929 (noting that the Tribunal established that harm was done to crops and timberlands in the Columbia River valley).

25. *Trail Smelter II*, 3 R.I.A.A. at 1965.

26. *Id.* ("[T]he Tribunal holds that the Dominion of Canada is responsible in international law for the conduct of the Trail Smelter."). *But see* Rebecca Bratspies, Little Guidance for COVID-19 Suits against China, JUST SEC. (July 14, 2020), https://www.justsecurity.org/71363/the-trail-smelter-arbitration-offers-little-guidance-for-the-covid-19-world-on-attempts-to-sue-china/ [https://perma.cc/68ZP-HXFA] (". . .while Canada ultimately paid damages to the United States, the Trail Smelter Arbitration did not decide that Canada was responsible for the actions of its smelter.").

27. *Trail Smelter I*, 3 R.I.A.A. at 1933 (indemnifying the United States $78,000 for damages since January 1, 1932 caused by the Trail Smelter).

28. *Trail Smelter II*, 3 R.I.A.A. at 1966–74 (establishing the permanent regime at Trail Smelter).

29. *Trail Smelter I*, 3 R.I.A.A. at 1934 (noting that the regime would allow for a control of fumigations without impacting the smelter's output).

30. *Id.* at 1933 (requiring the Canadian government to pay the United States and indemnity of $78,000 for damages between January 1, 1932, and October 1, 1937).

ing evidence from scientific experts.[31] As part of their judgment concerning Canadian compensation, the arbitrators considered evidence of the Americans' substandard farming techniques and practices.[32] The final award was reduced to account for the Americans' contribution to the harm they had suffered.[33] To its credit, Canada complied in full with the judgment.[34]

The *Trail Smelter Arbitration* is an imperfect source for an emerging customary international law norm. It is imbedded in its unique facts and context.[35] It is an old case. And its legal reasoning could have been sharper and more thorough. Some critics have complained that "its precedential value is somewhat inflated."[36]

But when it comes to reflecting on and applying the Transboundary Harm Principle, the *Trail Smelter Arbitration* has as many admirers as detractors. The static and dissonance around the case are a sign of its enduring value and vitality, not a justification for disregarding it. Dead precedent does not attract that kind of attention and engagement. Furthermore,

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31. *Trail Smelter I*, 3 R.I.A.A. at 1908–09, 1921; *Trail Smelter II*, 3 R.I.A.A. at 1958, 1966–67 (allowing for the two governments to designate an expert to aid the tribunal under Article II of the 1935 Special Agreement and for the submission of evidence under Article VIII, as well as specifically noting at multiple points in their two decisions the exceptional work of various experts).

32. *Trail Smelter I*, 3 R.I.A.A. at 1925 ("Failure of farmers to increase their seeded land in proportion to such increase in other localities, may also be taken into consideration.").

33. *Id.* at 1926 ("The Tribunal is of opinion that such injury to the soil itself can be cured by artificial means, and it has awarded indemnity with this fact in view on the basis of the data available.").

34. *Trail Smelter II*, 3 R.I.A.A. at 1949 (noting that the $78,000 indemnity found by the 1938 decision was paid by the 1941 decision).

35. *See generally* James R. Alum, *"An Outcrop of Hell": History, Environment, and the Politics of the Trail Smelter Dispute*, *in* TRANSBOUNDARY HARM IN INTERNATIONAL LAW: LESSONS FROM THE TRAIL SMELTER ARBITRATION 13 (Rebecca Bratspies & Russell Miller eds., 2006) (exploring the foundation of the Trail Smelter Dispute and the relationship between Trail, British Columbia and Stevens County in Washington state).

36. Young, *supra* note 7, at 377 (noting that the *Trail Smelter Arbitration's* "suitability as a judicial precedent for other events that may or may not constitute transboundary harm is dubious. This is certainly the case for events outside the scope of the subject matter addressed by the *Trail Smelter Arbitration*: events such as human movement and *international contagion*") (emphasis added).

when given the proper reading, the *Trail Smelter* case reveals its wisdom and ongoing utility as the seminal articulation of the customary international law Transboundary Harm Principle, which it helped to define as a cautious and proportional regime for assigning responsibility for border-transcending harm. For that reason, the case remains an extremely useful source for considering how to analyze and apply the Transboundary Harm Principle to new and contemporary issues.

B. *Modern Transboundary Harm Principle*

1. *Treaty and International Law Commission (ILC) Codification*

The Transboundary Harm Principle articulated and applied by the *Trail Smelter* arbitrators has since emerged as a customary international law rule that is generally applicable to and binding on all states in the event that domestic regulatory failure causes border-transcending harm.[37] This is especially true in the context of transboundary environmental harm. Many of the Principle's elements, usefully outlined and applied in the *Trail Smelter Arbitration*, have been codified in treaties and in the work of the ILC. The Principle's most significant influence and impact now must be measured by the large number of subsidiary, subsequent, and specific international law regimes that incorporate its DNA.

(a) *Treaty Codification*

The Transboundary Harm Principle has been incorporated into a number of treaty regimes. For example, the Stockholm Declaration on the Human Environment (1972) codi-

37. Two of the most important sources of public international law rules are treaties and customary international law. Treaties are mutual agreements among states by which the states signal their consent to be bound by law. States are obliged to fulfill the terms of these agreements. But the rules treaties create only bind the states that are party to the agreement. Customary international law establishes generally applicable, binding rules on the basis of states' general practice, if states engage in that practice because they believe they are required to do so by law. For the statutory basis of the hierarchy of sources in international law, see Statute of the International Court of Justice art. 38(1)[d] (San Francisco, 26 June 1945), 3 Bevans 1179, 59 Stat. 1055, T.S. No. 993, *entered into force* 24 Oct. 1945. *See also* HUGH THIRLWAY, THE SOURCES OF INTERNATIONAL LAW 10–11 (2d ed. 2019) (expanding upon the statutory text of international law sources).

fied the Transboundary Harm Principle.[38] So did the Convention on Biological Diversity (1992) and the Framework Convention on Climate Change (1992).[39] The Convention on the Law of the Non-navigational Uses of International Watercourses (1997), despite its limited adoption, also codified the Principle as it relates to waterways.[40]

(b) *International Law Commission Codification*

The Transboundary Harm Principle also informed the International Law Commission's work developing the Draft Articles on Responsibility of States for Internationally Wrongful Acts,[41] the Draft Articles on Prevention of Transboundary Harm from Hazardous Activities,[42] the Draft Principles on the Allocation of Loss in the Case of Transboundary Harm Arising out of Hazardous Activities,[43] and its continuing work on other subtopics related to international liability for injurious consequences arising out of acts not prohibited by international law.[44]

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38. U.N. Conference on the Human Environment, *Declaration of the United Nations Conference on the Human Environment*, 5, U.N Doc. A/CONF.48/14/Rev.1 (June 16, 1972) (generally known as the Stockholm Declaration).

39. Convention on Biological Diversity 147 (Rio de Janeiro, 5 June 1992) 1760 U.N.T.S. 79, *entered into force* 29 Dec. 1993; United Nations Framework Convention on Climate Change 166 (New York, 9 May 1992) 1771 U.N.T.S. 107, 31 I.L.M. 849 (1992), *entered into force* 21 Mar. 1994.

40. Convention on the Law of the Non-Navigational Uses of International Watercourses art. 7, ¶ 1, *opened for signature* May 21, 1997, 2999 U.N.T.S. 77, *entered into force* 17 Aug. 2014.

41. Draft Articles on Responsibility of States for Internationally Wrongful Acts, *in* Int'l Law Comm'n, Rep. on the Work of Its Fifty-Third Session, UN Doc. A/56/10, at 62 (2001).

42. Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, *in* Int'l Law Comm'n, Rep. on the Work of Its Fifty-Third Session, UN Doc. A/56/10, at 146 (2001).

43. Draft Principles on the Allocation of Loss in the Case of Transboundary Harm Arising Out of Hazardous Activities, *in* Int'l Law Comm'n, Rep. on the Work of Its Fifty-Eighth Session, UN Doc. A/61/10, at 58 (2006).

44. Int'l L. Comm'n, Rep. on the Work of Its Fifty-Second Session, UN Doc. A/55/10, at 65, 124 (2000) (first the ILC Draft Articles on State Responsibility and secondly ILC Draft Articles on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law).

(i) *Draft Articles on Responsibility of States*

Article 14(3) of the Draft Articles on Responsibility of States extends international responsibility to violations of "obligations of prevention" which the commentary describes as the "breach of an obligation to prevent the occurrence of an event."[45] The commentary to the Draft Articles recognizes the similarity between this obligation and Canada's ultimate obligation to the United States for failing to prevent the Trail Smelter's air pollution.[46] In this way the ILC recognizes the possibility of a state's regulatory negligence or failure, especially in the context of a transboundary harm, as a possible basis for a violation of international law.

No less important, the "general principles" of State Responsibility outlined in the Draft Articles on Responsibility of States "define in general terms the legal consequences of an internationally wrongful act of a State."[47] This includes two of the most prominent features of the *Trail Smelter Arbitration* remedy: that Canada must cease causing harm in the territory of the United States, and that Canada must compensate the United States for the harm the Trail Smelter caused. Regarding the former, the Tribunal ruled that "the Trail Smelter shall refrain from causing damage in the state of Washington in the future."[48] Regarding the latter, the Tribunal ruled that Canada should pay a compensatory indemnity for damages caused by the Trail Smelter from 1932 to 1937.[49] The Draft Articles include provisions on cessation of an internationally wrongful act,[50] on the one hand, and on compensation as a form of

45. Mark A. Drumbl, *Trail Smelter and the International Law Commission's Work on State Responsibility for Internationally Wrongful Acts and State Liability*, *in* TRANSBOUNDARY HARM IN INTERNATIONAL LAW: LESSONS FROM THE TRAIL SMELTER ARBITRATION 85, (Rebecca M. Bratspies & Russell A. Miller eds., 2006).

46. Draft Articles on Responsibility of States for Internationally Wrongful Acts, *supra* note 41, at 62.

47. *Id.* at 87.

48. *Trail Smelter I*, 3 R.I.A.A. at 1934.

49. *Id.* at 1933 (covering the indemnity from January 1932 to October 1937).

50. Draft Articles on Responsibility of States for Internationally Wrongful Acts, *supra* note 41, at 88 (Article 30).

reparation for committing an internationally wrongful act,[51] on the other hand.

Finally, the Draft Articles on Responsibility of States recognize, as the *Trail Smelter Arbitration* did, that the scope of the compensation owed to the injured state should be off-set by the injured state's own "contribution to the injury by willful or negligent action or omission."[52] The Tribunal reduced the compensation Canada owed to the United States after accounting for the inadequate remediation and adaptation undertaken by the harmed farmers.[53]

(ii) *Draft Articles on Prevention of Transboundary Harm from Hazardous Activities*

The Draft Articles on Hazardous Activities impose a duty of prevention even if the underlying activities are not prohibited by international law, but nevertheless "involve a risk of causing significant transboundary harm through their physical consequences."[54] The commentary to the Draft Articles on Hazardous Activities explains that prevention, as a general legal frame, is superior to obligations to "repair, remedy or compensate" because compensation is always an imperfect means of making the injured party whole, and because the capacity to prevent harm naturally increases as knowledge about causes and effects grows.[55] "In any event," the commentary concludes, "prevention as a policy is better than cure."[56] The commentary explicitly links the Draft Articles to the Transboundary Harm Principle, articulated in the *Trail Smelter Arbitration*, and recognizes the extension of its application beyond transboundary environmental harm to include a duty to prevent "transboundary harm to the environment, persons and property."[57] The Preamble to the Draft Articles on Hazardous Activities confirms the Transboundary Harm Principle's fun-

51. *Id.* at 98 (Article 36).

52. *Id.* at 109 (Article 39).

53. *Trail Smelter I*, 3 R.I.A.A. at 1926 ("The Tribunal is of opinion that such injury to the soil itself can be cured by artificial means, and it has awarded indemnity with this fact in view on the basis of the data available.").

54. Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, *supra* note 42, art 1.

55. *Id.* at 148, general cmt. ¶ 2 (General Commentary).

56. *Id.*

57. *Id.* at 148–49, general cmt. ¶¶ 4–5 (noting Trail Smelter I and II).

damental bargain by recognizing, on the one hand, the permanent sovereignty of states over their territory, and on the other hand, that the "freedom of states to carry on or permit activities in their territory . . . is not unlimited."[58]

The commentary further explains that the duty to prevent transboundary harm resulting from hazardous activities applies to "any hazardous and by inference any ultrahazardous activity which involves a risk of significant transboundary harm."[59] The Draft Articles on Hazardous Activities then lay out the substance of this duty. First, states are obliged to take all appropriate measures to prevent significant transboundary harm or, at least, to minimize the risk of harm.[60] Second, the measures should include "legislative, administrative or other action necessary for enforcing the laws, administrative decisions and policies."[61] Third, the aim of the required regulatory regime is to ensure that the state has exercised due diligence with respect to the risky hazardous activity: risky hazardous activity should receive authorization from the state following a risk assessment that benefited from consultation and cooperation with potentially affected states (and international organizations) following full and effective notice.[62]

The Draft Articles on Hazardous Activities do not, however, adopt a strict liability regime. Instead, they call for an "equitable" standard that requires the involved states to account for the risk of harm after a consideration of "all relevant factors," such as: the degree of risk of significant transboundary harm, the means available for preventing transboundary harm, the importance of the risky hazardous activity, the degree to which states are prepared to contribute to the costs of prevention, the economic viability of the activity relative to the costs of prevention, and the standards other states apply to the risky hazardous activity when occurring within

58. *Id.* at 146, pmbl.

59. *Id.* at 149, art. 1, cmt. ¶ 2.

60. *Id.* at 146, art. 3 (Prevention "The State of origin shall take all appropriate measures to prevent significant transboundary harm or at any event to minimize the risk thereof.").

61. *Id.* at 154, art. 3, cmt. ¶ 6.

62. *Id.* at 146–47, arts. 6–9.

their territories.[63] The *Trail Smelter Arbitration* pursued a similar equitable approach to regulating transboundary harm.[64]

The Draft Articles on Hazardous Activities also impose a number of affirmative duties to establish and administer the regulatory regime necessary to minimize (if not wholly preclude) transboundary harm resulting from risky hazardous activity. These include notice and consultation, as mentioned above. But they also include the duty to exchange information, to inform the public, to establish emergency plans to respond to the contingency of transboundary harm occurring as a result of risky hazardous activity, and dispute settlement commitments that also require establishment of an independent fact-finding commission in the event that transboundary harm is alleged to have occurred.[65]

2. *Application in Cases*

The International Court of Justice (ICJ or the Court) has enforced the Transboundary Harm Principle in a number of cases. Some of these cases involve environmental matters and represent a natural extension of the Principle from the *Trail Smelter* context. After all, it has been said that "[e]very discussion of the general international law relating to pollution starts, and must end, with a mention of the *Trail Smelter Arbitration*."[66] Other ICJ cases involve an application of the Principle's logic and parameters to disputes that are not concerned with transboundary environmental harm. Finally, it has become common for domestic courts to turn to the Trans-

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63. *Id.* at 147, art. 10 (requiring states to "take into account all relevant factors and circumstance.").

64. *See Trail Smelter II*, 3 R.I.A.A. at 1965 (underlying the principles of the Tribunal's ruling are "decisions in equity" and attempt to "be just to all parties concerned," noting that intervention was justified "when the case is of serious consequence").

65. Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, *supra* note 42, at 147–48, arts. 11–19. *See, e.g.*, Alistair Rieu-Clarke, *The Duty to Take Appropriate Measures to Prevent Significant Transboundary Harm and Private Companies: Insights from Transboundary Hydropower Projects*, 20 INT'L ENV'T AGREEMENTS: POL., L. & ECON. 667 (2020) (arguing that further guidance to States and private companies involved in transboundary hydropower project is desperately needed).

66. Alfred P. Rubin, *Pollution by Analogy: The Trail Smelter Arbitration*, 50 OR. L. REV. 259, 259 (1971).

boundary Harm Principle as the framework for resolving cases involving border-transcending harm.

(a) *The ICJ: The Transboundary Harm Principle and Environmental Harm*

(i) Pulp Mills on the River Uruguay (Argentina v. Uruguay) *(2010)*

A twenty-first century example of the Principle's application to environmental harm comes from the *Pulp Mills on the River Uruguay (Argentina v. Uruguay)* case, which was decided by the ICJ in 2010.[67] Argentina argued that Uruguay's plans to build pulp mills on its side of the River Uruguay would violate the procedural and substantive terms of the 1975 Statute of the River Uruguay.[68] The two states share the river as part of their border and the 1975 Statute established a joint regime covering conservation and the prevention of water pollution.[69] Argentina claimed that the proposed mills would be a source of transboundary pollution.[70] The ICJ opinion unfolded in three parts.

First, the Court underscored that, similar to the Transboundary Harm Principle applied in the *Trail Smelter Arbitration*, the Statute took a sustainable approach to the regulation of transboundary harm on the river by anticipating the "optimum and rational utilization" of the river, balanced with the need for "protection of the environment and joint management of this shared resource."[71]

Second, the Court stated that the Statute's cooperative regime, which is mandated by Article 36, achieves the aim of preventing transboundary pollution that is likely to damage

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67. Pulp Mills on the River Uruguay (Arg. v. Uru.), Judgment, 2010 I.C.J. 14 (Apr. 20).

68. *Id.* ¶ 1 (arguing that Uruguay was about to commit a violation of the Statute by building Pulp Mills).

69. *See generally* Statute of the River Uruguay, Arg.-Uru., Feb. 26, 1975, 1295 U.N.T.S. 331 (establishing guidelines between the two countries along their mutual border on the River Uruguay).

70. Pulp Mills on the River Uruguay (Arg v. Uru.), Application Instituting Proceedings, 2006 I.C.J. General List No. 115, ¶¶ 22, 24(f) (May 4).

71. Pulp Mills on the River Uruguay, *supra* note 67, ¶¶ 173–74; Statute of the River Uruguay, *supra* note 69, art. 1.

the river's ecological balance.[72] The Court explained that this involves several commitments: the states should coordinate their activities on the river through the joint mechanisms created by the Statute, they should adopt regulatory measures, either individually or jointly, to enforce the policies that result from their coordination, and they must exercise due diligence in enacting measures to preserve the river's ecology, that is, to prevent transboundary environmental harm.[73]

Third, and most notably, the Court ruled that Article 41 of the Statute places each state under an obligation to align its domestic regulatory regime with the goal of preventing transboundary harm to the river.[74] This obligation, the Court explained, is independent of the regulatory cooperation to which the states committed in the Statute.[75] Instead, the Court found that Article 41 codifies the Transboundary Harm Principle for the River Uruguay context.[76] Citing its advisory opinion on the *Legality of the Threat or Use of Nuclear Weapons*,[77] the Court recalled the general obligation each state has to "ensure that activities within its jurisdiction and control respect the environment of other States."[78] This restatement of the Transboundary Harm Principle, the Court insisted, is part of the "corpus of international law."[79]

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72. Pulp Mills on the River Uruguay, *supra* note 67, ¶ 183 (noting Article 36 of the Statute); Statute of the River Uruguay, *supra* note 69, art. 36 (establishing the duty of both countries "to avoid any change in the ecological balance and to control pests and other harmful factors in the river and the areas affected by it.").

73. Pulp Mills on the River Uruguay, *supra* note 67, ¶ 187 ("Both Parties are therefore called upon, under Article 36, to exercise due diligence in acting through the Commission for the necessary measures to preserve the ecological balance of the river.").

74. *Id.* ¶ 195 ("Thus, the obligation assumed by the Parties under Article 41 . . . is to adopt appropriate rules and measures within the framework of their respective domestic legal systems to protect and preserve the aquatic environment and to prevent pollution").

75. *Id.*

76. *Id.*

77. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 66 (July 8).

78. Pulp Mills on the River Uruguay, *supra* note 67, ¶ 193 (citing Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 66, ¶ 29 (July 8)).

79. *Id.* (citing Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 66, ¶ 29 (July 8)).

Furthermore, the Court framed Article 41 and the Transboundary Harm Principle it codifies as a matter of domestic regulatory due diligence encompassing the enactment and effective enforcement of measures that prevent pollution and protect the river. The Court explained that states must "maintain a certain level of vigilance in their enforcement and the exercise of administrative control applicable to public and private operators in its jurisdiction."[80] Argentina argued that Uruguay had not fulfilled this obligation citing the inadequate environmental impact assessment (EIA) Uruguay conducted with respect to the pulp mills. Both states agreed that an effective EIA, which must assess an activity's "potential harmful transboundary effects on people, property and the environment of other States," is the kind of regulatory duty established by the Transboundary Harm Principle.[81] The Court confirmed this obligation by reference to "State practice and the International Law Commission 2001 draft Articles on Prevention of Transboundary Harm from Hazardous Activities."[82]

Having established these standards, a majority of the Court nevertheless concluded that Uruguay satisfied its obligations under Article 41 and the Transboundary Harm Principle, in particular with respect to the environmental impact assessment it performed as part of the pulp mills project.[83]

(ii) *Nuclear Weapons Cases*

The *Pulp Mills* case cited the ICJ's previous application of the Transboundary Harm Principle to a dramatic transboundary environmental harm issue: the international law implications of states' testing, and potential deployment, of nuclear weapons.

In the *Nuclear Tests Case (Australia & New Zealand v. France)* (1974),[84] the Court granted provisional measures ordering France to suspend nuclear weapons tests in the South Pacific while the merits of the case were under considera-

80. *Id.* ¶ 197.
81. *Id.* ¶ 203.
82. *Id.*
83. *Id.* ¶ 282 ("By eleven votes to three, *Finds* that the Eastern Republic of Uruguay has not breached its substantive obligations under Articles 35, 36 and 41 of the 1975 Statute of the River Uruguay.").
84. Nuclear Tests (Austl. v. Fr.), Judgment, 1974 I.C.J. 253 (Dec. 20); Nuclear Tests (N.Z. v. Fr.), Judgment, 1974 I.C.J. 457 (Dec. 20).

tion.[85] Australia argued that the provisional measures protected its legal interests regarding "sovereignty over its territory" and the "independent right to determine what acts shall take place within its territory."[86] Both of these claims are central components of the Transboundary Harm Principle. In its application for provisional measures, Australia cast the interests secured by the Principle in absolute terms,[87] arguing that "*any* radio-active material" entering its territory from the French nuclear tests would constitute a violation.[88] Australia framed this right as a matter of its authority to "ensure the protection not only of the population . . . in general but of every individual included therein."[89] This is stricter than the more measured, equitable rule employed in the *Trail Smelter Arbitration* and later codified in the Draft Articles on Prevention of Transboundary Harm from Hazardous Activities.[90]

Turning to causality, Australia also expanded the rule applied in the *Trail Smelter Arbitration*. Australia admitted that the causal-link between the harm done by radioactive fall-out and France's weapons tests would be "diffuse," but insisted that the Transboundary Harm Principle would be implicated if the French test "contributes in a measurable degree to the sum total of human ill."[91] In the Australian portrayal of the rule, the degree of harm and the quantum of evidence establishing causality also were more permissive than the rule applied in the *Trail Smelter Arbitration*, which called for legal responsibility in cases of "serious consequence" that are proven by "clear and

85. Nuclear Tests (Austl. v. Fr.), Provisional Measure, 1973 I.C.J. 99, at 106 (June 22) (establishing as a temporary measure that "the French Government should avoid nuclear tests causing the deposit of radio-active fallout on Australian territory.").

86. Nuclear Tests (Austl. v. Fr.), Application Instituting Proceedings, 1973 I.C.J. 2, 28 (May 9); Nuclear Tests (Austl. v. Fr.), Provisional Measure, 1973 I.C.J. 99, ¶ 22 (June 22) (citing Australia's application in the Provisional Measure).

87. Nuclear Tests (Austl. v. Fr.), Provisional Measures, 1973 I.C.J. 43, ¶ 53. (May 9).

88. *Id.* ¶ 4 (emphasis added).

89. *Id.* ¶ 53.

90. Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, *supra* note 42, at 146.

91. Nuclear Tests (Austl. v. Fr.), Memorial on Jurisdiction and Admissibility Submitted by the Government of Australia, 1973 I.C.J. 249, ¶ 454 (Nov. 23).

convincing evidence."[92] Australia characterized its territorial sovereignty as a right under general international law that protected it from the harmful effects of trespass, especially if those effects impair its autonomy to determine what acts may take place within its territory.[93] Australia insisted that this entitlement (essentially the Transboundary Harm Principle) is so "evident" that extended legal argument would be "superfluous."[94] It is quite obvious, Australia argued, "that a state possesses a legal interest in the protection of its territory . . . as well as in the defense of the well-being of its population."[95]

In granting Australia's request for provisional measures in the *Nuclear Tests Case,* the Court affirmed a version of the Transboundary Harm Principle that is broader and stricter than the Principle announced in the *Trail Smelter Arbitration.* The more rigorous framing of the Principle is related to the exceptional, and exceptionally hazardous, character of nuclear weapons. The important point is that the Court regarded some version of the Transboundary Harm Principle as an enforceable norm. The Court issues provisional measures only when the circumstances require them in order to preserve a legal right.[96] In the *Nuclear Tests Case,* the Court observed that there was a possibility of harm to Australia's legal interests and that provisional measures were necessary "in order to preserve the right claimed by Australia in the present litigation."[97] This conclusion implied that the only matter in dispute on the merits was whether the facts confirmed Australia's claim that the French tests constituted a violation of the Transboundary Harm Principle.

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92. *Trail Smelter II,* 3 R.I.A.A. at 1965.

93. *See* Nuclear Tests (Austl. v. Fr.), Memorial on Jurisdiction and Admissibility Submitted by the Government of Australia, 1973 I.C.J. 249, ¶ 456 (Nov. 23) (asserting that "a State possesses a legal interest in the protection of its territory from any form of external harmful action, as well as in the defence of the well-being of its population and in the protection of national integrity and independence").

94. *Id.*

95. *Id.*

96. Statute of the International Court of Justice, art. 41, ¶ 1, June 26, 1945. ("The Court shall have the power to indicate, if it considers that circumstances so require, any provisional measures which ought to be taken to preserve the respective rights of either party.").

97. Nuclear Tests (Austl. v. Fr.), Provisional Measures, 1973 I.C.J. 99, ¶ 30 (June 22).

In the end, the Transboundary Harm Principle was not decisive in the case. The Court ultimately dismissed Australia's claims because French commitments to cease its South Pacific nuclear weapons testing program made the merits phase of the case moot.[98]

Two decades later, in its advisory opinion on the *Threat or Use of Nuclear Weapons*, the Court once again categorically affirmed the Transboundary Harm Principle's status as a customary rule of international law applicable to transboundary environmental harm.[99] In offering its views on the question of the legality of the use of nuclear weapons, the Court considered the *jus contra bellum* and the *jus in bello*, including the U.N. Charter's prohibition on the threat or use of force and well-established humanitarian law.[100] The Court also considered a range of international environmental rules, some of which were general and others representing *lex specialis* concerned with environmental protection during armed conflict.[101] The Court concluded that the use of nuclear weapons would have severely harmful (and inherently transboundary) effects.[102] It also recognized that "the general obligation of states to ensure that activities within their jurisdiction and control respect the environment of other states or of areas beyond national control is now part of the corpus of international law relating to the environment."[103] Still, as in the *Trail Smelter* case, the Court framed the Transboundary Harm Principle in equitable terms. In this way, it retreated from the more robust rule it seemed to endorse in the Australia case. In its advisory opinion, the Court concluded that the Transboundary Harm Principle and other environmental norms do not constitute a

98. Nuclear Tests (Austl. v. Fr.), Judgment, 1974 I.C.J. 253, ¶ 62 (Dec. 20).

99. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 27 (July 8).

100. *Id.* ¶¶ 38, 86 (covering the United Nations Charter prohibitions on the use of force and *jus in bello* respectively).

101. *Id.* ¶ 27 (citing 1977 Additional Protocol to Geneva Convention, art. 35(3); 1977 Convention Against Hostile Use of the Environment; 1972 Stockholm Declaration; 1992 Rio Declaration, Principle 2).

102. *Id.* ¶ 35 ("The destructive power of nuclear weapons cannot be contained in either space or time. They have the potential to destroy all civilization and the entire ecosystem of the planet.").

103. *Id.* ¶ 29.

"total restraint during military conflict."[104] As an example of this balanced dynamic, the Court explained that states retain their inherent right to self-defense, perhaps even extending to the use of nuclear weapons.[105] But the Court insisted that the immense damage resulting from the use of nuclear weapons, including transboundary environmental harm, must factor into the proportionality and necessity considerations that condition a state's exercise of its right to self-defense.[106]

(b) *The ICJ: The Transboundary Harm Principle Beyond the Environment*

The Transboundary Harm Principle is most frequently invoked in environmental cases. But, critically, the Principle has been applied in a number of other contexts as well. This jurisprudence invites extending the application of the Principle to the COVID-19 public health crisis.

Most famously, the Principle was determinative in the *Corfu Channel Case (United Kingdom of Great Britain and Northern Ireland v. People's Republic of Albania)* (1949).[107] The ICJ ruled that Albania was responsible under international law for the harm done to British navy vessels by mines located in the portion of the Corfu Channel controlled by Albania.[108] Under the law of the sea, the British navy was entitled to pass through those waters, which connect the Adriatic Sea and the Mediterranean Sea.[109] The Court concluded that Albania's exclusive

104. *Id.* ¶ 30.

105. *Id.* ¶¶ 96–97 (establishing that while states retain the right to self-defense "when its survival is at stake," the Court could not reach a definitive decision on whether the use of nuclear weapons in self-defense, in a case where the alternative is the potential extinction of the State, would be justified).

106. *See id.* at ¶ 30 (stating that "[t]he Court does not consider that the treaties in question could have intended to deprive a State of the exercise of its right of self-defence under international law because of its obligations to protect the environment.").

107. Corfu Channel (U.K. v. Alb.), 1949 I.C.J. 4 (Apr. 9).

108. *Id.* at 36 (establishing that "the People's Republic of Albania is responsible under international law for the explosions which occurred on October 22nd, 1946, in Albanian waters, and for the damage and loss of human life that resulted therefrom").

109. *Id.* at 28–29 (explicating the international law rights to pass through a strait in peacetime and that the Corfu Channel meets this strait definition).

control of the territory (including the territorial waters) within its frontiers created the prospect of international responsibility for harm occurring within or emanating from its territory.[110] Even while it claimed to be unaware of the mines that damaged the U.K.'s ships, the Albanian government did not dispute that a showing of knowledge or negligence regarding the mines would incur international law responsibility.[111]

The Court characterized the controlling Transboundary Harm rule, with obvious echoes from the *Trail Smelter Arbitration*, as "certain general and well-recognized principles, namely: . . . every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States."[112] Building on the sovereign interests at issue in the *Trail Smelter Arbitration*, the ICJ reiterated the Transboundary Harm Principle and gave it new, more wide-ranging, and enduring prominence for future decisions involving non-environmental harm.[113] The due diligence standard demanded by the Court in the *Corfu Channel Case* is, in part, sourced from the Principle upon which the *Trail Smelter* arbitrators relied.[114]

The Transboundary Harm Principle has also been extended to cross-border armed activities. The applicable *jus cogens* rules,[115] anchored in the U.N. Charter,[116] are referred to as the "principle of non-use of force and . . . the principle of

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110. *Id.* at 23 (holding Albania liable for the damage caused by mines within Albania's territorial waters).

111. *Id.* at 22 (expressing that the Albanian government did not inherently dispute the international legal obligation).

112. *Id.*

113. *See* ROUTLEDGE RSCH. INT'L L., THE ICJ AND THE EVOLUTION OF INTERNATIONAL LAW: THE ENDURING IMPACT OF THE CORFU CHANNEL CASE 298 (Karine Bannelier et al. eds., 2011) (noting that *Trail Smelter*, along "with the *Corfu Channel* case statement under consideration here – has formed a cornerstone of international environmental law and would be reiterated by the ICJ in later cases.").

114. *See id.* ("Yet cast as a general principle, the statement of law relative to due diligence had in fact already been af?rmed by international tribunals" specifically noting *Trail Smelter*).

115. Vienna Convention on the Law of Treaties art. 53, May 23, 1969, 1155 U.N.T.S. 331 (defining the nature of Jus Cogens as "a norm accepted and recognized by the international community of States as a whole as a norm from which no derogation is permitted," also known as a preemptory norm).

116. U.N. Charter art. 2, ¶ 4.

non-intervention."[117] In *Military and Paramilitary Activities in and Against Nicaragua (Nicaragua v. United States of America)* (1986), the ICJ applied these principles to the United States' direct armed activities in Nicaragua as well as to the United States' support for the organized, paramilitary opposition to the Nicaraguan government.[118] With respect to the latter, the activities consisted of border-transcending financial support, training, supplying weapons, providing intelligence, and providing logistics support that harmed Nicaragua's right "to conduct its affairs without outside interference."[119] The Court explained that "[b]etween independent States, respect for territorial sovereignty is an essential foundation of international relations," which, in turn, is a "corollary of the principle of the sovereign equality of States."[120] It is obvious how these principles draw on and find support in the Transboundary Harm Principle, which serves to reinforce states' territorial sovereignty against significant intrusions by other states.[121] In the *Nicaragua* case, the Court concluded that the United States' support of the Contra rebels doubled as violations of the principle of non-use of force and non-intervention, and of the foundational mandate for the integrity of a state's territorial sovereignty.[122] Combined, those *jus cogens* and specialized norms express central elements of the Transboundary Harm Principle.

This focused use of the Transboundary Harm Principle was central to the ICJ's more recent judgement in *Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v.*

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117. Armed Activities on the Territory of the Congo (Dem. Rep. Congo v. Uganda), Judgment, 2005 I.C.J. 168, ¶ 345 (Dec. 19).

118. Military and Paramilitary Activities in and Against Nicaragua (Nicar. v. U.S.), Judgment, 1986 I.C.J. Rep. 14 (June 27).

119. *Id.* ¶ 202.

120. *Id.* (internal citations omitted).

121. *E.g.*, Rose Rivera, *U.S. State Responsibility á la Trail Smelter: Arms Trafficking and Transboundary Harm to Mexico*, 5 MEXICAN L. REV. 3, 24 (July 2012) (discussing the *Nicaragua* case as an example of a "[s]pecific expression of the duty to prevent transboundary harm" through "organized acts of armed force against other states and illegal arms trafficking.").

122. *Nicaragua*, 1986 I.C.J. at ¶¶ 250–51 (holding "infringements of the territorial sovereignty of Nicaragua" by the United States implicate both "prohibition of the use of force and of non-intervention").

Uganda) (2005).[123] In that case, the Court reinforced the essence of the Transboundary Harm Principle by recognizing Uganda's international law responsibility to exercise vigilance in preventing rebel groups from using its territory as a base for conducting operations on the other side of the border in the Democratic Republic of Congo.[124]

(c) *Domestic Cases*

The Transboundary Harm Principle now also colors domestic courts' interpretation of national law when they are confronted with disputes involving international transboundary environmental harm. This should not be surprising because the Principle has its origins in U.S. Supreme Court jurisprudence concerned with the settlement of transboundary disputes between states of America's federal union.[125]

The *Pakootas v. Teck Cominco* case is an example of the Transboundary Harm Principle's contemporary role in the interpretation and application of domestic environmental law.[126] *Pakootas* again involved the smelter at Trail, British Columbia, which was accused in this century of dumping slag and effluent into the Columbia River.[127] The riparian pollution was carried downstream into the United States where it was

123. Armed Activities on the Territory of the Congo (Dem. Rep. Congo v. Uganda), Judgment, 2005 I.C.J. 168 (Dec. 19).

124. *Id.* at ¶¶ 161–65 (establishing a violation of the principle of non-intervention and non-use by Uganda).

125. *See Trail Smelter II*, 3 R.I.A.A. at 1964 (The arbitrators explained: "There are, however, as regards, both air pollution and water pollution, certain decisions of the Supreme Court of the United States which may legitimately be taken as a guide in this field of international law, for it is reasonable to follow by analogy, in international cases, precedents established by that court in dealing with controversies between States of the Union or with other controversies concerning quasi-sovereign rights of such States, where no contrary rule prevails in international law and no reason for rejecting such precedents can be adduced from the limitations of sovereignty inherent in the Constitution of the United States.") (citing Missouri v. Illinois, 200 U. S. 496 (1906); Georgia v. Tennessee Copper Co., 237 U.S. 474 (1915); Georgia v. Tennessee Copper Co., 237 U.S. 678 (1915); New York v. New Jersey, 256 U.S. 296 (1921); New Jersey v. City of New York, 283 U.S. 473 (1931)).

126. Pakootas v. Teck Cominco Metals, Ltd., 452 F. 3d 1066 (9th Cir. 2006); Pakootas v. Teck Cominco Metals, Ltd., 905 F.3d 565 (9th Cir. 2018).

127. Pakootas, 452 F. 3d at 1069–70.

registered at unsafe levels in the tribal waters of the Colville Native American community based in northeastern Washington state.[128] The Confederated Tribes eventually sued in U.S. federal court alleging that the smelter's operator had not fulfilled its obligations under American environmental law (particularly the Comprehensive Environmental Response, Compensation, and Liability Act) to mitigate and cleanup the environmental harm it had done in the U.S.[129] A key question in the case was whether the Canadian industrial firm should be accountable under the U.S. environmental law regime.[130]

Implicitly enforcing the Transboundary Harm Principle, the Ninth Circuit Court of Appeals interpreted the controlling American legislation in a manner that permitted the application of U.S. law to the smelter operator's conduct because it had effects across the border in the United States.[131] This interpretation in part relied on the "domestic effects exception" to the presumption against extraterritorial application of U.S. law.[132] The point of the "domestic effects exception" is to buttress American territorial sovereignty by ensuring that American law, alongside other regimes, responds to transboundary harm emanating from other states.

The American *Pakootas* case is just one example of the national domestication of the Transboundary Harm Principle. After surveying other jurisdictions for the Transboundary Harm Principle's influence on domestic environmental proceedings, one commentator concluded: "[It is] more likely that in the contemporary time a Trail Smelter type dispute

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128. *Id.* at 1070 (noting the EPA determination that the slag "adversely affects the surface water, ground water, sediments, and biological resources of the Upper Columbia River and Lake Roosevelt.").

129. *Id.* at 1068 (establishing the legal question as "whether a citizen suit based on Teck's alleged non-compliance with the Order is a domestic or an extraterritorial application of the Comprehensive Environmental Response, Compensation, and Liability Act").

130. *Id.* at 1069-71 (exploring the issue of whether the Federal district court had subject matter jurisdiction on Teck, the operator of Trail Smelter, despite Teck having "no presence in the United States" and the alleged harm occurring within Canada).

131. *See id.* at 1068–69 (holding Teck could be subject for damage under CERCLA).

132. *Id.* at 1076–77.

would indeed be resolved at the level of a private dispute [in a national court]."[133]

C. *Summarizing the Modern Transboundary Harm Principle*

The extensive use—even omnipresence—of the Transboundary Harm Principle in international law, now extending to non-environmental harm and to domestic disputes, is an acknowledgment of the wisdom and practicability with which it resolves a "clash of sovereignties."[134] The Principle seeks to reaffirm a state's sovereign authority over its territory while insisting that those rights be exercised in a way that does not cause clearly proven, significant harm in the sovereign territory of another state.

Drawing on the evolved and expanding application of the rule beyond purely environmental damage to other cases and contexts, the Transboundary Harm Principle can be reduced to the following elements: the existence of a serious injury; causation; and calculable damage resulting from the injury as the basis for a remedy.[135] All must be established by clear and convincing evidence. Summarized with somewhat greater precision, the Transboundary Harm Principle involves the following analysis:[136]

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133. Martijn van de Kerkhof, *The Trail Smelter Case Re-examined: Examining the Development of National Procedural Mechanisms to Resolve a Trail Smelter Type Dispute*, 27 MERKOURIOS - UTRECHT J. INT'L & EUR. L. 68, 82 (2011).

134. Rebecca Bratspies & Russell Miller, *Introduction*, *in* TRANSBOUNDARY HARM IN INTERNATIONAL LAW: LESSONS FROM THE TRAIL SMELTER ARBITRATION 1, 3 (Rebecca M. Bratspies & Russell A. Miller eds., 2006).

135. *See Trail Smelter II*, 3 R.I.A.A. at 1965 (synthesized from the finding of the Tribunal).

136. For slightly different framings of the principle, see OSCAR SCHACHTER, INTERNATIONAL LAW IN THEORY AND PRACTICE 366 (1991) (establishing four elements for transboundary environmental harm: (1) "the harm must have resulted from human activity", (2) "the harm mut result from a physical consequence of the casual human activity.", (3) the physical effects cross national boundaries", (4) "the harm must be significant or substantial"); XUE HANQIN, TRANSBOUNDARY DAMAGE IN INTERNATIONAL LAW 4 (2003) (adopting Schachter's four pronged structure); Young, *supra* note 7, at 383–84 (proposing a compilation of six elements for classification as a transboundary harm, drawing from environmental law, treaty law, and judicial precedent). They may be more detailed in some instances, but these characterizations largely speak to the elements identified here.

Modern Transboundary Harm Principle	
The following elements should be considered, relying on clear and convincing evidence, with the aim of reaching an equitable resolution to a claim of transboundary harm.	
Harm	**Has there been a harm of serious consequence?** • tangible harm • intangible harm
Causation	**Was the harm caused by activity occurring in the territory of another state?** • activity engaged in by the state (state action) • or private activity facilitated or tolerated by the state (regulatory failure)
Remedy	**If a violation of the Principle is recognized, then the harmed state should be awarded a fair and equitable remedy, including:** • an order establishing a regime that mitigates the transboundary harm resulting from the sustainable continuation of the activity • an order for compensation for the transboundary harm already suffered by the complaining state but accounting for the complaining state's contribution to the harm suffered

One commentator explained that the rule replaces the traditional, absolute rule against non-intervention with a rule permitting *de minimis* interference as long as it does not cause injury of serious consequence.[137] But, where there is provable, substantial harm done in the territory of another state, then

137. *See* Alfred P. Rubin, *Pollution by Analogy*, *in* TRANSBOUNDARY HARM IN INTERNATIONAL LAW: LESSONS FROM THE TRAIL SMELTER ARBITRATION 46, 53 (Rebecca M. Bratspies & Russell A. Miller eds., 2006) (exploring the differences in international law before and after Trail Smelter as it relates to transboundary harm).

the Transboundary Harm Principle grants the harmed state relief.[138]

III. The Transboundary Harm Principle and the COVID-19 Pandemic

There is a compelling nexus between the COVID-19 pandemic and the Transboundary Harm Principle.[139] First, if it can be shown (by clear and convincing evidence) that an activity in one state (where the outbreak originated) caused the serious harm associated with the pandemic, then the rule announced in the *Trail Smelter Arbitration* would apply. Second, the Transboundary Harm Principle then gives the harmed states a basis for attributing international law responsibility to the state in which the pandemic originated and entitles the harmed states to injunctive and compensatory remedies. The COVID-19 pandemic is among the most calamitous global developments in the last eighty years. It is right that international law should provide a framework for responding to it. The applicable rule prohibiting transboundary harm provides a cautious and proportional regime for this delicate and complex set of circumstances.

To better understand the Transboundary Harm Principle's possible application to the current crisis, the following section applies the Principle's central elements to the COVID-19 pandemic. In doing so, we must delve deeply into the facts and reasoning of the *Trail Smelter Arbitration*, which is the seminal—and still immensely insightful and illustrative—application of the Principle to a dispute between states.

A. *Standard of Proof: Clear and Convincing Evidence*

One of the curiosities of the *Trail Smelter Arbitration*, coloring its use as the primary illustration of the application of the

138. *See id.* (explicating the grounds for relief under the Transboundary Harm Principle).

139. *But see* Bratspies, *supra* note 26; Sienho Yee, *To Deal with a New Coronavirus Pandemic: Making Sense of the Lack of Any State Practice in using State Responsibility for Alleged Malfeasances in a Pandemic—Lex Specialis or Lex Generalis at Work?,* 19 CHINESE J. INT'L L. 237, 238–39 (2020) (identifying a "conspicuous absence" of State responsibility or practice in the area of international health and arguing one conclusion could be a *lex specialis* against transboundary harm liability in the case of a pandemic).

Transboundary Harm Principle, is the fact that the arbitrators largely drew the substantive rule they announced from American law. The reason for this is that Article IV of the Special Agreement committing the United States and Canada to arbitration (1935 Convention for the Settlement of Difficulties Arising from Operations of the Smelter at Trail, B.C.) provided that "[t]he Tribunal shall apply the law and practice followed in dealing with cognate questions in the United States of America as well as international law and practice . . . ."[140]

This explains why the arbitrators' incorporated the "clear and convincing evidence" standard of proof into the Transboundary Harm Principle they announced. This heightened standard is not the typical rule in American civil law proceedings. But it was drawn from the relevant equitable apportionment jurisprudence of the U.S. Supreme Court, which featured prominently in the *Trail Smelter* panel's reasoning. The "clear and convincing evidence" test is more rigorous than the standard of proof commonly applied in public international law disputes. The more demanding evidentiary standard should reassure states accused of causing transboundary harm that their sovereign rights to independence and territorial control will not be casually disregarded on the basis of unsubstantiated claims. But neither is the "clear and convincing evidence" standard so strict that the harmed state will find it almost impossible to assert its sovereign right to be free from external interference and harm.

1. *The "Clear and Convincing Evidence" Standard in U.S. Law*

(a) *Background*

Although it was drawn from American jurisprudence, the "clear and convincing evidence" test applied in the *Trail Smelter Arbitration* is not a common standard of proof in the United States. For example, in criminal proceedings, factual elements must be proven "beyond a reasonable doubt."[141]

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140. *Trail Smelter I*, 3 R.I.A.A. at 1908 (Article IV of the 1935 Special Agreement).

141. *Reasonable Doubt*, BLACK'S LAW DICTIONARY (11th ed. 2019). *See* In re Winship, 397 U.S. 358, 364 (1970) (requiring "beyond a reasonable doubt" to be the constitutional minimum for criminal proceedings per the Due Process Clause of the Fourteenth Amendment); Victor v. Nebraska, 511 U.S. 1, 5 (1994) (noting that despite the beyond a reasonable doubt standard being

This is often regarded as the most demanding evidentiary standard, requiring the fact-finder to assess whether "the truth of its factual contentions are "*highly* probable."[142] Most civil matters, conversely, require the facts to be established by a "preponderance of the evidence."[143] That low threshold is met when a fact-finder determines the evidence "to be sufficiently reliable and sufficiently probative to demonstrate the truth of the asserted proposition with the requisite degree of certainty."[144] The civil law's preponderance of the evidence standard is considerably lower than the imposingly high standard applied in the criminal law context.[145]

The different standards of proof recognize the different values implicated by the criminal law and civil law regimes. As the Supreme Court explained: "The function of a standard of proof, as that concept is embodied in the Due Process Clause and in the realm of fact-finding, is to instruct the fact-finder concerning the degree of confidence our society thinks he should have in the correctness of factual conclusions for a particular type of adjudication."[146] In civil cases, the balance of justice plays out between two (theoretically) equal private parties with (theoretically) equal opportunities to represent their causes before the court. In that context it is enough to demand that the parties merely prove that a factual claim is more

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"an ancient and honored aspect of our criminal justice system, it defies easy explication."); John Calvin Jefferies, Jr. & Paul B. Stephan III, *Defenses, Presumptions, and Burden of Proof in the Criminal Law*, 88 YALE L. REV. 1325, 1328–38 (1979) (exploring how *In re Winship* was the first case that held the Due Process Clause of the Fourteenth Amendment required a beyond a reasonable doubt standard for criminal prosecution).

142. Colorado v. New Mexico, 467 U.S. 310, 316 (1984) (citing CHARLES MCCORMICK, HANDBOOK ON THE LAW OF EVIDENCE 679, §320 (1954)) (emphasis added).

143. *Black's Law Dictionary* provides a breakdown of the matters that require a preponderance of the evidence standard. *See Preponderance of the Evidence*, BLACK'S LAW DICTIONARY (11th ed. 2019).

144. Concrete Pipe & Prods. v. Constr. Laborers Pension Trust, 508 U.S. 602, 622 (1993).

145. *See Preponderance of the Evidence*, BLACK'S LAW DICTIONARY (11th ed. 2019) (stating that the preponderance of the evidence standard does not require a juror to "free [her] mind wholly from all reasonable doubt," while a criminal standard does require this threshold due to the seriousness of criminal convictions).

146. Addington v. Texas, 441 U.S. 418, 423 (1979) (citing In re Winship, 397 U.S. 358, 370 (1970)) (Harlan, J., concurring).

probable than not.[147] But in criminal proceedings it is thought that the government should face a much higher burden than the "preponderance of the evidence" standard.[148] This is colored by heightened concerns involving all the power of the state—including its monopoly on violence—and the threat that power poses to the accused's life or liberty.

Yet, in a small number of American civil proceedings, the courts have demanded that the facts be established by clear and convincing evidence.[149] This standard lies between the nearly insuperable "beyond a reasonable doubt" standard used in the criminal law and the permissive "preponderance of the evidence" standard required in civil law cases.[150] This evidentiary middle path has been taken when the interests implicated by the civil process seem weighty enough to demand greater evidentiary rigor, such as in civil cases that, although involving formally private law matters, implicate the concerns that justify the very high standard of proof in criminal law cases.[151] This includes intrusions on fundamental rights to individual liberty and property ownership. Some examples include: proceedings involving the termination of parental rights;[152] denaturaliza-

147. *E.g.*, In re Winship, 397 U.S. 358, 371 (1970) (noting that a factfinder just needs to believe "the existence of a fact is more probable than its nonexistence").

148. *Id.* at 363–64 ("The reasonable-doubt standard plays a vital role in the American scheme of criminal procedure. It is a prime instrument for reducing the risk of convictions resting on factual error. . . . Due process commands that no man shall lose his liberty unless the Government has borne the burden of convincing the factfinder of his guilt. To this end, the reasonable-doubt standard is indispensable . . .").

149. ROBERT P. MOSTELLER ET AL., MCCORMICK ON EVIDENCE, §341 (8th ed. 2020) (noting that a higher standard of proof than preponderance of the evidence is required in certain civil cases, known generally as clear and convincing evidence).

150. *Evidence*, BLACK'S LAW DICTIONARY (11th ed. 2019) ("this is a greater burden than preponderance of the evidence, the standard applied in most civil trials, but less than evidence beyond a reasonable doubt, the norm for criminal trials.").

151. *See* Santosky v. Kramer, 455 U.S. 745, 756 (1982) (holding a preponderance of the evidence burden as insufficient for termination of parental rights); Addington v. Texas, 441 U.S. 418, 425 (1979) (noting that a clear and convincing evidence standard has been used in civil cases with penalties that go beyond financial damages).

152. *See Santosky*, 455 U.S. at 756 (ruling that a preponderance of the evidence standard for the termination of parental rights was unconstitutional, with clear and convincing evidence being the minimum).

tion;[153] deportation;[154] and involuntary commitment to a health-care institution.[155] In those cases, in order to reinforce the importance of liberty, the courts require more than just a preponderance of the evidence.[156]

(b) *Equitable Apportionment Cases*

Notably, the "clear and convincing evidence" standard has been used in what are known as "equitable apportionment" cases between two constituent states of the American union. For example, in the Supreme Court jurisprudence that touches upon sovereignty disputes involving the water resource interests of two U.S. states.[157] It also happens to be the standard in the body of caselaw towards which Article IV of the U.S.–Canada Special Agreement in the *Trail Smelter Arbitration* clearly points. In those cases, the Supreme Court relies on a heightened standard of proof because they involve the states' immensely important interest in territorial sovereignty.[158] The arbitrators merely adopted the logic and rules of that caselaw—including the balancing device of requiring "clear and convincing evidence" as a standard of proof—for applica-

153. *See* Chaunt v. United States, 364 U.S. 350, 353 (1960) (requiring a clear, unequivocal, and convincing evidence standard to set aside a naturalization decree).

154. *See* Woodby v. I.N.S., 385 U.S. 276, 286 (1966) (stating that the standard of review for deportation proceedings is clear and convincing due to potential hardships of erroneous decisions).

155. *See Addington*, 441 U.S. 418, 425–33 (1979) (requiring that a minimum of clear and convincing evidence is required for involuntary commitment to mental hospitals).

156. *See id.* at 431–32 (1979) ("We note that 20 states, most by statute, employ the standard of 'clear and convincing' evidence; 3 states use 'clear, cogent, and convincing' evidence; and 2 states require 'clear, unequivocal and convincing' evidence."); United States v. Comstock, 560 U.S. 126, 163 (2010) (exploring civil commitment under clear and convincing evidence at it relates to sex offenders).

157. *See* Mississippi v. Tennessee, 142 S. Ct. 31, 37 (2021) (noting the history of equitable apportionment as "the exclusive judicial remedy for interstate water disputes" by the Supreme Court's original jurisdiction).

158. *See* New York v. New Jersey, 256 U.S. 296, 309 (1921) ("Before this court can be moved to exercise its extraordinary power under the Constitution to control the conduct of one State at the suit of another, the threatened invasion of rights must be of serious magnitude and it must be established by clear and convincing evidence.") (citing Missouri v. Illinois, 200 U.S. 496, 521 (1906)).

tion between the international parties to the *Trail Smelter Arbitration*.

Considering the arbitral panel's mandate to find an equitable solution to the Trail Smelter difficulties, the "clear and convincing evidence" standard from the Supreme Court's equitable apportionment cases must have had a strong appeal. In those disputes the Supreme Court relies on the "clear and convincing evidence" standard because it favors the *status quo* over poorly-substantiated claims. At the same time, it does not preclude judicial intervention and remedial action when the facts justifying the claim are clearly and convincingly established.[159] The degree to which the "clear and convincing evidence" standard favors the *status quo* priority ascribed to a state's sovereign right to control and use its territory can be seen from canonical Supreme Court equitable apportionment cases, one of which the arbitrators referred to in their 1941 judgement.[160]

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159. *See* Colorado v. New Mexico, 459 U.S. 176, 187 (1982) ("The harm that may result from disrupting established uses is typically certain and immediate, whereas the potential benefits from a proposed diversion may be speculative and remote.").

160. *Trail Smelter II*, 3 R.I.A.A. at 1964 (exploring Missouri v. Illinois, 200 U.S. 496(1906)) (alteration in original). In *Missouri v. Illinois* the state of Missouri was seeking an injunction against the state of Illinois, which allowed sewage to be dumped into a draining canal that, in turn, flowed into the Mississippi River basin. Missouri v. Illinois, 200 U.S. 496, 517 (1906). Missouri worried that the sewage would "poison the water of the river. . . as to make it unfit for drinking, agricultural, or manufacturing purpose." *Id.* In St. Louis, deaths from typhoid fever had more than doubled since the drainage canal was opened in Chicago a few years earlier. *Id.* at 523. In response to Missouri's alleged intrusion on its territorial autonomy, the state of Illinois raised factual questions about causality, including doubts about the source of the bacteria and the chance that bacteria connected to the Chicago sewage canal could have a harmful effect so far away in St. Louis. *Id.*

The holding and reasoning of the *Missouri v. Illinois* case are described for the purpose of discussing the standard of proof to be applied in an international law Transboundary Harm case. But the factual parallels between that case and the case of a pandemic are clear: regulatory failure in one state causing illness in another. There seems to have been no dispute that Illinois could be held legally accountable for its acts or omissions in relation to the sewage dumped in its territory, so long as those acts or omissions could be clearly and convincingly shown to be the cause of the illness in Missouri. The Supreme Court's conclusion that the issue of causation hadn't been satisfactorily proven doesn't undermine the legal integrity of the underlying claim: conduct in the territory of one state causing illness in the territory of another state can be the basis of an American equitable apportionment claim. Following the *Trail Smelter* tribunal's embrace of the *Missouri v. Illinois* case,

2. *Standards of Evidence in International Law*

Besides its provenance in American inter-state disputes, the *Trail Smelter Arbitration* panel's reliance on the "clear and convincing evidence" standard of proof is unique for at least two other reasons. First, it is a rare, explicit declaration of a standard of proof in a public international law framework. Second, the "clear and convincing evidence" test is more rigorous than the default standard the International Court of Justice has applied in its cases.

Notoriously, despite its extensive function as a fact-finder, the International Court of Justice has not employed a clearly defined standard of proof.[161] Neither the Court's Statute nor its Rules resolve the issue. This means that, from case to case, or even within one case, the Court may refer to different standards of proof.[162] One commentator explained that "the Court gives [only occasional] indications of how it appraises particular types of evidence, [but] it generally applies a very

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the analogous relevance to the current pandemic is obvious and compelling. Illinois argued that the bacteria could have come from other sources along the Mississippi River and may not have originated in Chicago at all. *Id.* at 525–26. Illinois argued that the river could be polluted from other towns on the bank in Missouri or from other, unidentified places in Illinois, making causality problematic. *Id.* Experiments conducted to test whether bacteria could survive the trip downstream to St. Louis were inconclusive. *Id.*

In light of the evidence shown, the Supreme Court concluded that the case fell below the burden of proof required to establish a violation of Missouri's rights and to justify remedial action: "[O]ur conclusion upon the present evidence is that the case proved falls so far below the allegations of the bill that it is not brought within the principles heretofore established in the cause." *Id.* at 526. The Court referred to the applicable standard of evidence as "clearly and fully proved," but that was eventually restated as the better-known "clear and convincing evidence" standard. *Id.* at 521. In *Missouri v. Illinois*, the doubts muddying the issue of causality ultimately doomed Missouri's case. *Id.* at 524–25.

161. *See* Katherine Del Mar, *The International Court of Justice and Standards of Proof, in* THE ICJ AND THE EVOLUTION OF INTERNATIONAL LAW: THE ENDURING IMPACT OF THE CORFU CHANNEL CASE 98, 99 (Bannelier et al. eds., 2011) ("A reading of the Court's case law quickly confirms that the Court does not apply one standard of proof across the board, but rather varying standards.").

162. *Id.* ("[T]he Court has on a number of occasions articulated different standards of proof, sometimes within the same case.").

open-ended, discretionary evidentiary standard."[163] The lack of specificity regarding the applicable standard of review is not unique to the International Court of Justice. Public international law in general has not much concerned itself with the issue of standards of proof. Some scholars suggest that this is a legacy of international law's roots in the civil law tradition.[164] In the civil law tradition, a judge enjoys decision making freedom that extends to her assessment of the facts.[165] A prescriptive standard of proof is viewed as an intrusion on that autonomy.

Against this backdrop it is significant that *Trail Smelter Arbitration* so affirmatively settled the issue of how the arbitrators were to assess the evidence presented in the case. Several considerations might have motivated the panel to build a clearly articulated standard of proof into the Transboundary Harm Principle. First, the fact that the case involved two common law countries suggests that the arbitrators would have been familiar with the common law jurist's expectation that the assessment of the facts of the case would be guided by an articulated standard of review. Second, the arbitrators were well aware that, more than many other public international law disputes in that era, the *Trail Smelter* case would involve extensive and exceedingly complex technological and scientific evidence relating to the sources and extent of the harm claimed by the United States. For that reason, the arbitrators might have welcomed a settled standard of proof to guide their engagement with the challenging evidence in the case. Third, the arbitrators might have been happy to seize on the "clear and convincing evidence" standard of proof as one of several elements they could use for striking the delicate, equitable balance between the contending states' claims to sovereignty that the Special Agreement demanded.

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163. Simone Halink, *All Things Considered: How the International Court of Justice Delegated its Fact-Assessment to the United Nations in the* Armed Activities *Case*, 40 INT'L L. & POL. 13, 21 (2008).

164. Del Mar, *supra* note 161, 105 (exploring the lack of notion of standards of proof in civil law systems, and thus its relation to international law).

165. *See* JOHN HENRY MERRYMAN, THE CIVIL LAW TRADITION: AN INTRODUCTION TO THE LEGAL SYSTEMS OF EUROPE AND LATIN AMERICA 36 (Rogelio Pérez-Perdomo ed., 4th ed. 2019) (establishing that the Civil Law Judges focus on the facts of the situation and the statute and let the conclusion follow).

As applied in the *Trail Smelter Arbitration* the "clear and convincing evidence" standard of proof seems particularly well-suited to advancing the last of those concerns. Just as the standard carves a middle-path in the American law of evidence, it also is positioned between the possibilities on the spectrum of evidentiary standards used in public international law. Clear and convincing evidence is more demanding than the "balance of the probabilities" standard that some regard as the default rule in the International Court of Justice and in many arbitral matters.[166] That standard is thought to be commensurate with the "preponderance of the evidence" test used for civil matters in common law jurisdictions.[167] But neither is the "clear and convincing evidence" test as rigorous as two standards sometimes used in international law: "beyond a reasonable doubt" or "fully conclusive."[168]

The International Court of Justice has adopted heightened standards of proof when "the charges leveled against a state are considered to be particularly serious."[169] The *Corfu Channel Case*, mentioned earlier as an example of the implied

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166. For examples of the use of the "balance of probabilities" standard in international law and arbitral cases, see Advaya Hari Singh, *A Clear Standard of Proof in Disputes Before the ICJ: Are We There Yet?*, CAMBRIDGE INT'L L.J. – POSTS (Mar. 5, 2021), http://cilj.co.uk/2021/03/05/a-clear-standard-of-proof-in-disputes-before-the-icj-are-we-there-yet/; Stephen Wilkinson, *Standards of Proof in International Humanitarian and Human Rights Fact-Finding and Inquiry Missions*, GENEVA ACADEMY OF INTERNATIONAL HUMANITARIAN LAW AND HUMAN RIGHTS, https://www.geneva-academy.ch/joomlatools-files/docman-files/Standards%20of%20Proof%20in%20Fact-Finding.pdf [https://perma.cc/AJ2X-V4TP]; Caroline E. Foster, *Burden of Proof in International Courts and Tribunals*, 29 AUSTL. Y.B. INT'L L. 27, 60 (2011); Kabir Duggal & Wendy W. Cai, *Principles of Evidence in Public International Law as Applied by Investor-State Tribunals: Burden and Standards of Proof*, 2 BRILL RSCH. PERSP. INT'L INV. L. & ARBITRATION 1, 40–42 (2019).

167. *See* Foster, *supra* note 166, at 60 (noting that Judge Greenwood in the *Pulp Mills* case was equivocating the Civil Law's "on the balance of the probabilities" with the Common Law's "preponderance of the evidence").

168. Evidence, BLACK'S LAW DICTIONARY (11th ed. 2019) ("this is a greater burden than preponderance of the evidence, the standard applied in most civil trials, but less than evidence beyond a reasonable doubt, the norm for criminal trials"). Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Croat. v. Yugoslavia), Judgment, 2007 I.C.J. Rep. 43, ¶ 209 (Feb. 27) (noting that the International Court of Justice "has long recognized that claims against a State involving charges of exceptional gravity must be proved by evidence that is fully conclusive").

169. *Foster,* supra note 166, at 61.

application of the Transboundary Harm Principle, is one of those cases.[170] The Court found that the exceptional gravity of the United Kingdom's allegations of Albania's complicity in mine-laying in the Channel demanded a high degree of certainty regarding the proof offered by the U.K.[171] Yet, in the context of the incendiary claims of state responsibility at the center of the *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America)*, the Court resorted to a somewhat less-demanding standard: a "degree of certainty" regarding the facts of the case.[172] It is important to note that, with its middle-ground standard, the Transboundary Harm Principle doesn't call for the very high level of factual integrity required by the Court in the *Corfu Channel Case*.

At the same time, the "clear and convincing evidence" test is more rigorous than the "balance of probabilities" test Judge Greenwood proposed for environmental disputes in his separate opinion in the *Pulp Mills* case.[173] Judge Greenwood reasoned that a higher standard of proof, in cases involving complex technical and scientific facts that often implicate evidence controlled by the opposing party, might have the effect "of making it all but impossible for a State to discharge the burden of proof."[174] Similar arguments could be made for the application of a permissive standard of proof in human rights cases.[175] Significantly, at least as applied in the *Trail Smelter* case, the Transboundary Harm Principle explicitly rejects that reasoning and calls for the elevated, but not unattainable, "clear and convincing evidence" standard of proof. This is in

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170. *See id.* at 61–62 (noting that the Court pressed for a higher burden of proof than the UK argued for in "showing with reasonable certainty the complicity of Albania").

171. Corfu Channel (U.K. v. Alb.), 1949 I.C.J. 4, 17 (Apr. 9).

172. Military and Paramilitary Activities in and Against Nicaragua (Nicar. v. U.S.), Judgment, 1986 I.C.J. Rep. 14, ¶ 29 (June 27).

173. Pulp Mills on the River Uruguay (Arg v. Uru.), 2010 I.C.J. 221, ¶ 25 (Apr. 20) (separate opinion by Greenwood, J.)

174. *Id.* ¶¶ 25–26 (noting the use of a burden of proof higher than "balance of the probabilities" for crimes such as genocide).

175. *See* JULIANE KOKOTT, THE BURDEN OF PROOF IN COMPARATIVE AND INTERNATIONAL HUMAN RIGHTS LAW 200–02 (1998) (exploring the trend in various regional courts, including the Inter-American Court of Human Rights and the European Court of Human Rights, towards an intermediate standard in human rights law especially in cases involving disappearances and torture).

keeping with the cautious and proportional nature of the Principle.

3. *Standard of Proof and the Pandemic*

The proof needed to justify restricting a state's enjoyment of its sovereign autonomy under the Transboundary Harm Principle must be more than merely probative.[176] To show that a pandemic constitutes a violation of the Transboundary Harm Principle, the complaining states will have to meet the "clear and convincing evidence" standard's elevated evidentiary expectations with respect to each of the Principle's material elements. The barrier to a successful assertion of the Transboundary Harm Principle that is erected by the "clear and convincing evidence standard" preserves and promotes the *status quo* priority international law gives to every state's sovereign entitlement to use and govern its territory as it chooses. But the lesson the *Trail Smelter Arbitration* underscored is that the extent of a state's sovereignty knows some bounds. The limit is understood to be the point where the enjoyment of a state's sovereign prerogative results in very well proven and significant harm in another sovereign's territory.

Yet, the "clear and convincing evidence" standard of proof seems unlikely to be the decisive factor in the application of the Transboundary Harm Principle to the COVID-19 pandemic. There is strong evidence relating to the material elements of a claim under the Transboundary Harm Principle: causation and serious harm.

(a) *Clear and Convincing Evidence of Causation*

There is no credible factual dispute that events in China precipitated the pandemic.[177] If one of the material elements

176. *See supra* Section III.A.1(b) (The "Clear and Convincing Evidence" Standard in U.S. Law).

177. China has sought to challenge the fact of the outbreak's origins in that country. The Council on Foreign Relations "Backgrounder" report noted that "Chinese officials have consistently rejected not only the hypothesis that the virus originated at the Wuhan laboratory, but that it originated in China at all . . . Meanwhile, Beijing has called on the WHO to investigate the possibility that the pandemic started in other countries, including in the United States." Claire Felter, *Will the World Ever Solve the Mystery of COVID-19's Origin?*, COUNCIL ON FOREIGN RELATIONS – BACKGROUNDER (Nov. 3, 2021), https://www.cfr.org/backgrounder/will-world-ever-solve-mystery-covid-19s-

of the Transboundary Harm Principle requires proof that the border-transcending viral outbreak originated in China, then it seems resolved to nearly everyone's satisfaction—and to a degree far exceeding the "clear and convincing evidence" standard—that COVID-19 emerged, first afflicted humans, and began to spread to the rest of the world from Wuhan, China.[178]

Of course, there are competing theories about what events in China might have occasioned the outbreak. One theory is that a zoonotic transfer of the virus from animals to humans occurred as a result of the consumption of infected wildlife, or that a domesticated source of meat that had come into contact with infected wildlife.[179] Another is that the virus

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origin [https://perma.cc/9H7T-E8JW]. But that position should be compared with the matter-of-fact reporting by mainstream news agencies, which treat the pandemic's origins in China as a settled matter. For example, Deutsche Welle news recently concluded: "Tuesday marks two years since the first known death in the COVID-19 pandemic was reported in the central Chinese city of Wuhan. It was here that the virus was first detected and began spreading among the population on a large scale." William Yang, *COVID Two Years On: World Still Awaits Answers about Virus Origin*, DEUTSCHE WELLE (Jan. 11, 2022), https://www.dw.com/en/covid-two-years-on-world-still-awaits-answers-about-virus-origin/a-60388262 [https://perma.cc/WSY8-Y5XK]. *See Origins and Obfuscation, The World Needs a Proper Investigation into How Covid-19 Started*, THE ECONOMIST (Aug. 21, 2021), https://www.economist.com/international/2021/08/21/the-world-needs-a-proper-investigation-into-how-covid-19-started [https://perma.cc/75HK-CAHN] (noting that the joint study recognized that the first COVID-19 outbreak happened in Wuhan, China).

178. Carl Zimmer et al., *First Known Covid Case Was Vendor at Wuhan Market, Scientist Says*, N.Y. TIMES (Nov. 18, 2021), https://www.nytimes.com/2021/11/18/health/covid-wuhan-market-lab-leak.html [https://perma.cc/J4AQ-3CUJ] (synthesizing new scientific evidence with pre-existing knowledge, noting that despite disputes over whether an accountant or an animal market vendor was patient zero, the virus likely originated in Wuhan, China).

179. For examples of arguments supporting the Zoonotic theory, see Steven Poole, *'Zoonotic': The Covid-19 Origins Theory that is Not that Batty*, THE GUARDIAN (June 18, 2021), https://www.theguardian.com/books/2021/jun/18/zoonotic-the-covid-19-origins-theory-that-is-not-that-batty [https://perma.cc/8LRL-P3XM]; Jon Cohen, *Call of the Wild: Why Many Scientists Say it's Unlikely that SARS-CoV-2 Originated from a "Lab Leak"*, SCIENCE (Sept. 2, 2021), https://www.science.org/content/article/why-many-scientists-say-unlikely-sars-cov-2-originated-lab-leak [https://perma.cc/825A-J7YK].

leaked from an experimental laboratory in Wuhan.[180] It is possible that neither of these theories could be proven by clear and convincing evidence. They are intensely disputed, and many scientific observers suggest that the dispute will not, or cannot, be conclusively resolved.[181]

Still, either theory would suffice for proving causation under the Transboundary Harm Principle, because both demonstrate that China's territory was the locus of the pandemic's outbreak. Both theories involve a measure of regulatory failure that could be proven, by clear and convincing evidence, to be the cause of the pandemic. Chinese regulatory failure with respect to food-safety measures could be shown to have facilitated a zoonotic transfer.[182] Or, Chinese regulatory failure could be shown to have led to the mismanagement of safety and containment at the Wuhan Institute of Virology laboratory.[183] Neither prevailing theory creates doubt about

180. For examples of arguments supporting the Lab Leak theory, see Peter Beaumont, *Did Covid Come from a Wuhan Lab? What we Know so Far*, THE GUARDIAN (May 27, 2021), https://www.theguardian.com/world/2021/may/27/did-covid-come-from-a-wuhan-lab-what-we-know-so-far [https://perma.cc/9DDJ-FBSZ]; Carolyn Kormann, *The Mysterious Case of the Covid-19 Lab-Leak Theory*, THE NEW YORKER (Oct. 12, 2021), https://www.newyorker.com/science/elements/the-mysterious-case-of-the-covid-19-lab-leak-theory [https://perma.cc/B3HP-ZDEU].

181. *See generally* Claire Klobucista, *Will the World Ever Solve the Mystery of COVID-19's Origin*, COUNCIL FOREIGN RELATIONS (Nov. 3, 2021), https://www.cfr.org/backgrounder/will-world-ever-solve-mystery-covid-19s-origin [https://perma.cc/89XJ-6J47] (exploring the lack of scientific consensus between the lab leak and zoonotic theories and the lack of prospect for future resolution due to geopolitical factors).

182. For discussions of the ineffectiveness of past regulatory measures, see Adam Minter, *China Can't Ignore Its Food-Safety Issues*, BLOOMBERG OPINION (Mar. 30, 2021), https://www.bloomberg.com/opinion/articles/2021-03-30/china-can-no-longer-ignore-its-food-safety-issues [https://perma.cc/F75W-J2PN]; Kristie Pladson, *Coronavirus: A Death Sentence for China's Live Animal Markets*, DEUTSCHE WELLE (Mar. 25, 2021), https://www.dw.com/en/coronavirus-a-death-sentence-for-chinas-live-animal-markets/a-56986431 [https://perma.cc/9DNM-E4Y3]; *China 'Comprehensively Bans' Wildlife Trade over Coronavirus*, FRANCE24 (Feb. 24, 2020), https://www.france24.com/en/20200224-china-comprehensively-bans-wildlife-trade-over-coronavirus [https://perma.cc/SX54-BDAM] (exploring China's food safety standards and alleging systematic failure that could have aided in fermenting the COVID-19 pandemic).

183. *See* Beaumont, *supra* note 180; Kormann, *supra* note 180 (both exploring the connection of the Wuhan Institute of Virology to the Lab Leak theory).

where the outbreak started, and both would be a product of regulatory failure in China. Whichever theory might be shown to be true, there is clear and convincing evidence that Chinese action or inaction helped to foster the outbreak that indisputably originated in China.

(b) *Clear and Convincing Evidence of Serious Harm*

Whether regarded as "serious harm" or not, the evidence is clear and convincing that the pandemic was the cause of immense harm around the world to life, well-being, and economic interests. The causal link between those harms and the pandemic are evident to a degree that transcends any possible doubt and would satisfy even the strictest standard of evidence.[184]

B. *Is there Harm of Serious Consequence in the Complaining State's Territory?*

To succeed with a transboundary harm claim, the complaining state must be able to point to an "injury" of "serious consequence" in its territory.[185] This raises at least two fundamental questions: what kind of injury qualifies as "harm" for the purposes of the Transboundary Harm Principle, and what qualifies as a "serious consequence"?

The following discussion, however, focuses exclusively on potential legal parameters for making a showing of "seriousness" under the Trail Smelter Principle. The effort to develop the relevant facts for the application of those parameters to the COVID-19 case would involve an actuarial accounting of all the economic consequences of the pandemic as well as a survey of the relevant international standards and best practices in food safety and viral research containment. That effort exceeds the capacity and expertise of the present author and the scope of the present article. Still, the following explanation

184. *See* Eduardo Levy Yeyati & Federico Filippini, *Social and Economic Impact of COVID-19*, 4–12 (Brookings Inst. Glob. Working Paper No. 158, June 2021) (exploring the fiscal, social, and wider economic damages that have come about due to the COVID-19 pandemic); *The Impact of COVID-19 on Global Health Goals*, WORLD HEALTH ORG. (May 20, 2021), https://www.who.int/news-room/spotlight [https://perma.cc/V5LQ-JU8Z] (exploring the impacts of the COVID-19 pandemic on global health outcomes).

185. *Trail Smelter II*, 3 R.I.A.A. at 1965.

of the relevant law offers a glimpse into the factual issues that would have to be considered when determining whether the worldwide effects of the pandemic would qualify as an actionable "harm or serious consequence" under the Transboundary Harm Principle.

1. *What Kind of Harm?*

The Transboundary Harm Principle is concerned with tangible as well as intangible harm. The eligible harm can include damage to public or private interests. But, where private interests are harmed, the Transboundary Harm Principle does not establish an international law claim to be raised by individuals. In its 1938 judgment, the *Trail Smelter* tribunal explained:

> The controversy is between two Governments involving damage occurring in the territory of one of them (the United States of America) and alleged to be due to an agency situated in the territory of the other (the Dominion of Canada), for which damage the latter has assumed by the Convention an international responsibility. In this controversy, the Tribunal is not sitting to pass upon claims presented by individuals or on behalf of one or more individuals by their Government, although individuals may come within the meaning of "parties concerned" . . . and of "interested parties," . . . and although the damage suffered by individuals may, in part, "afford a convenient scale for the calculation of the reparation due to the State."[186]

The Principle first provides a rule for resolving interstate disputes. It also provides that, at least for the purpose of a transboundary harm claim, the complaining state counts private injuries as evidence of harm to its sovereign territory.

In the following sub-sections the possible range of injuries covered by the Transboundary Harm Principle are sketched, including a potential harm excluded from the Principle's coverage (mere intrusion on a state's territorial sovereignty), harm to the environment (which is the classical injury to which the Principle is applied), and the novel suggestion that the Principle applies to some non-environmental injuries rele-

186. *Trail Smelter I*, 3 R.I.A.A. at 1912–13.

vant in the context of the COVID-19 pandemic (such as human health and economic interests).

(a) *Intrusion on State Sovereignty*

One form of harm excluded by the paradigmatic *Trail Smelter Arbitration* is the claim that border-transcending activity originating in one state's territory injured another state through the mere diminishment of its sovereignty.[187] That not-insignificant concern is addressed by the *jus cogens* norms securing territorial sovereignty and sovereign equality, especially through the right to non-intervention and the prohibition on the use of force that are now codified by the U.N. Charter.[188] Generally speaking, there are two elements to an "unlawful intervention" that would be less specific than a "transboundary harm." The first element involves one state's intervention in the affairs of another state.[189] The second element requires an intrusion into a realm in which a state is permitted to act freely as a component of its sovereignty.[190] The general principle of non-intervention can be seen as a *jus cogens* corollary to the sovereign rights of a state.[191]

Different to the general right to be free from intervention, the Transboundary Harm Principle focuses on violations of the fundamental guarantees of sovereignty that involve documentable, tangible, and intangible damage in the territory of the harmed state. This means that the Transboundary Harm Principle constitutes a customary *lex specialis* addressed to circumstances involving harm that exceeds a simple diminishment of a state's sovereignty.

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187. *Id.* at 1933 (explaining that the tribunal was deciding the matter exclusively on the mandate given to it by the 1935 Special Agreement and it concluded that, in the framework of the Convention, the U.S. had not asserted the kinds of facts that merited indemnity for a violation of its sovereignty).

188. *See* U.N. Charter art. 2, ¶ 4 ("All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations.").

189. Jamnejad & Wood, *supra* note 14, at 347.

190. *Id.*

191. *See id.* at 358 ("Non-intervention is not itself a norm of *jus cogens*, although specific rules that fall within the principle may be, in particular the prohibition of aggression.").

(b) *Environmental Harm*

The most straightforward transboundary harm case involves tangible damage to property or the environment. That, after all, was the essence of the case decided in the *Trail Smelter Arbitration*. There seems to have been no dispute that the United States suffered tangible property and environmental damage prior to 1932. The tribunal noted that the smelter entered into numerous U.S. settlements and purchased "smoke easements" in relation to American property interests in the first decades of the twentieth century.[192] When that strategy for managing the affair fell through, the two governments referred the matter to a standing International Joint Commission, which took the existence of tangible property or environmental damage in the United States for granted and instead focused its recommendations on the nature and value of indemnification.[193] The Trail Smelter tribunal integrated those prior findings into its 1938 decision, summarily concluding that "[f]rom 1925, at least, to the end of 1931, [environmental] damage occurred in [the U.S.]"[194]

The arbitrators then undertook an original assessment of the existence of harm after January 1932. Injury to tangible property and environmental damage took center stage, including harm done to immoveable and moveable property (cleared land, uncleared land, urban property, and livestock).[195]

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192. *Trail Smelter I*, 3 R.I.A.A. at 1915.

193. *Id.* at 1918 (explaining how the International Joint Commission handled the case in 1929 through 1931).

194. *Id.* at 1917.

195. *Id.* at 1920. The tribunal methodically accounted for "all the evidence" in concluding that some forms of injury had been satisfactorily proven. It found that a reduction in crop yield and an impairment of soil in the affected area used for farming constituted an injury to immoveable property. *Id.* at 1918. It found that smoke damage to forests in Washington state reduced the value of harvestable timber and that this also constituted an actionable injury to immoveable property. *Id.* at 1931. At the same time, the tribunal found that there was no proof of damage to immoveable urban property in the town of Northport. *Id.* (deciding that there is no proof of damage to urban property in Northport). And the tribunal was not convinced that there had been tangible injury to moveable property such as livestock (or to the productivity of livestock in providing milk or wool). *Id.* In its 1941 decision accounting for alleged damage occurring after the first arbitral decision was issued in 1938, the tribunal once again prioritized tangi-

Building on the legacy of the *Trail Smelter Arbitration*, the Transboundary Harm Principle traditionally has been thought to be relevant primarily when there is damage to property interests or harm to the environment.[196] This would seem to exclude the application of the Transboundary Harm Principle to a pandemic. After all, the COVID-19 outbreak wreaked mortal havoc on human health and devastatingly disrupted economic activity, but it did not tangibly harm property or ecosystems.

(c) *Beyond Environmental Harm: Human Health and the Economy*

Injury to human health and economic losses also count as eligible harm under the Transboundary Harm Principle. These concerns have obvious significance for the application of the Principle to the pandemic. In the *Pulp Mills* case, for example, the International Court of Justice concerned itself with alleged injury to "*people*, property and the environment" in Argentina.[197] In its nuclear weapons cases, the Court also applied an expanded understanding of harm that went beyond damage to eco-systems. In the *Nuclear Tests* case, Australia asserted harm to its entire population, "including every individual therein."[198] And in its advisory opinion regarding the *Legality of the Threat or Use of Nuclear Weapons*, the ICJ recognized that the environment "is not an abstraction but represents the living space, the quality of life and *the very health of*

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ble property and environmental damage. The arbitrators reviewed updated evidence and concluded that the United States failed "to prove that any fumigation between October 1, 1937, and October 1, 1940, has caused injury to crops, trees or otherwise." *Trail Smelter II*, 3 R.I.A.A. at 1959.

196. *See* James F. Jacobson, *Through the Looking Glass: Sustainable Development and Other Emerging Concepts of International Environmental law in Gabcikovo-Nagymaros Case and the Trail Smelter Arbitration*, *in* TRANSBOUNDARY HARM IN INTERNATIONAL LAW: LESSONS FROM THE TRAIL SMELTER ARBITRATION 140 (Rebecca M. Bratspies & Russell A. Miller eds., 2006) (exploring the connections of Trail Smelter to the historic roots of the environmental segment of international law).

197. Pulp Mills on the River Uruguay, *supra* note 67, ¶ 203 (emphasis added).

198. Request for the Indication of Interim Measures of Protection Submitted by the Government of Australia, Nuclear Tests (Austl. v. Fr.), 1973 I.C.J. Pleadings 43, ¶ 53. (May 9, 1937).

human beings."[199] These cases involve an application of the Transboundary Harm Principle to harm other than tangible damage to property or the environment.

(i) *Harm to Human Health*

In any case, a broader understanding of the "environment" to include human health conforms to the settled understanding in ecological science—an understanding now reflected in international law. Environmental protection, properly conceived, consists of a matrix of related and intersecting interests, including human health.[200] The European Environment Agency, in a report addressing the pandemic's lessons for efforts to promote sustainability, succinctly concluded that "human health and environmental integrity are intertwined."[201] Elsewhere, the Agency has noted that climate change, as an environmental concern, poses "immediate threats to health, in terms of heat waves and shifts in the patterns of infectious diseases and allergens."[202]

The Transboundary Harm Principle would not be the only public international law framework recognizing the linkage between the environment and human health. One study found that over three hundred environmental treaties and conventions explicitly address concerns for health, either through statements of principles and objectives, or, occasion-

199. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 66, ¶ 29 (July 8) (emphasis added).

200. For detailed discussions of the established relationship between environmental and global health considerations in international law, see JOHN TOBIN, THE RIGHT TO HEALTH IN INTERNATIONAL LAW 217–19 (2012); Jean-Frédéric Morin & Chantal Blouin, *How Environmental Treaties Contribute to Global Health Governance*, 15 GLOBALIZATION & HEALTH art. 47 at 1 (2019); Yasmin von Schirnding et al., *International Environmental Law and Global Public Health*, 80 BULL. WORLD HEALTH ORG. 970, 970 (2002) (both exploring the relationship between human health and the environment).

201. EUR. ENV'T AGENCY, *COVID-19: Lessons for Sustainability?* (Jan. 20, 2022), https://www.eea.europa.eu/publications/covid-19-lessons-for-sustainability/covid-19-lessons-for-sustainability/ [https://perma.cc/S3DW-C5FD] .

202. EUR. ENV'T AGENCY, Environment and Health (Nov. 23, 2020), https://www.eea.europa.eu/themes/human/intro/ [https://perma.cc/P2LR-94UH].

ally, through concrete rules or provisions.[203] This catalogue of international action on human health includes several fundamental environmental law regimes: Stockholm Declaration (1972),[204] Rio Declaration on Environment and Development (1992),[205] Agenda 21 (1992),[206] Convention on Biological Diversity (1992),[207] Framework Convention on Climate Change (1992),[208] Johannesburg World Summit on Sustainable Development (2002),[209] and the Paris Agreement (2016).[210]

One report explained the entwinement between humankind's health and the environment in this way:

> The natural environment is the thin layer of life and life supports, called the biosphere, that contains the earth's air, soil, water, and living organisms. The connection between protecting the natural environment and safeguarding human health has been recognized for some time. In recent decades the focus of research and legislation has been identifying and regulating environmental toxics to reduce harmful human exposures. The effect of various environmental exposures, such as toxic chemicals, air pollution, and biological agents on the human body, is commonly perceived as the central problem in environmental health. However, maintaining a healthy envi-

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203. *See* Morin & Blouin, *supra* note 200, at fig. 2 (noting the presence of over 300 "environmental treaties with health-related provisions" as of 2017).

204. U.N. Conference on the Human Environment, *Declaration of the United Nations Conference on the Human Environment*, 3, U.N Doc. A/CONF.48/14/Rev.1 (June 16, 1972).

205. U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development,* U.N. Doc. A/CONF.151/26 (Vol. I), annex I (Aug. 12. 1992).

206. U.N. Conference on Environment and Development, *Agenda 21*, U.N. Doc. A/CONF.151/26 (Vol. I), annex II (Aug. 13, 1992).

207. Convention on Biological Diversity, *opened for signature* June 5, 1992, 1760 U.N.T.S. 79 (entered into force Dec. 29, 1993).

208. United Nations Framework Convention on Climate Change (New York, 9 May 1992) 1771 U.N.T.S. 107, 31 I.L.M. 849 (1992), *entered into force* 21 Mar. 1994.

209. World Summit on Sustainable Development, *Johannesburg Declaration on Sustainable Development*, U.N. Doc. A/CONF.199/20 (Sept. 4, 2002).

210. Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104, *entered into force* 4 Nov. 2016.

> ronment extends beyond controlling these hazards.[211]

The deepening awareness of the link between the environment and human health, and the potential for international environmental law to serve as a galvanizing force "both nationally and internationally in favour of public health,"[212] fueled the United Nations Human Rights Council's recent adoption of a resolution recognizing the human right to a clean, healthy, and sustainable environment.[213]

The Director General of the World Health Organization confirmed the relationship between environmental protection and the risks posed to human health by pandemics:

> The COVID-19 pandemic has highlighted the intimate links between humans and our environment. Addressing those links is essential to prevent diseases, including future pandemics, to promote health, drive the global recovery and reduce health risks associated with climate change, especially for the most vulnerable.[214]

Standing on its own, harm to human health can be the basis of a claimed violation of the Transboundary Harm Principle. But even if a more rigid and traditional understanding of the Principle is adopted, for example an approach that would limit the application of the Principle to environmental harm, then the proper conceptualization of the "environment" now also extends to impacts on human health because of our increased understanding of the environment's effect on health. In either case, the death and ill-health caused by the COVID-19 pandemic constitute injuries that would be actionable under the Transboundary Harm Principle.

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211. INST. OF MED., HEALTH AND THE ENVIRONMENT IN THE SOUTHEASTERN UNITED STATES 22 (Howard Frumkin et al. eds., 2002).

212. Von Schirnding et al., *supra* note 200, at 973.

213. Human Rights Council Res. 48/13, U.N. Doc. A/HRC/RES/48/13 (Oct. 18, 2021) (recognizing a human right to a healthy environment by the Human Rights Council at the United Nations).

214. *U.S. EPA and WHO Partner to Protect Public Health*, WORLD HEALTH ORGANIZATION (Jan. 20, 2022), https://www.who.int/news/item/20-01-2022-u.s.-epa-and-world-health-organization-partner-to-protect-public-health/ [https://perma.cc/73XT-BVSS].

(ii) *Economic Harm*

The case for applying the Transboundary Harm Principle to economic losses is more complex because there are several distinct forms of economic consequences associated with the pandemic.

The first is the *direct economic loss* associated with the death and ill-health caused by COVID-19. These costs are better understood as the calculable damages attributable to the tangible health harm produced by the pandemic. They would be recovered as compensation in a Transboundary Harm remedy but are not an independent harm unto themselves.

The second, and related, cost involves the *indirect economic losses resulting from state polices imposed and private measures undertaken as part of efforts to mitigate the spread of the virus*. These are the costs resulting from the lockdowns, business closures, school closures, and the costs of vaccine development and distribution. While these costs are distinct economic costs, they are the product of reasonable and suitable responses to the more direct harm threatened by the pandemic.

The third class of economic impact from the pandemic involves the *attenuated economic commitments made by states in an attempt to mitigate the fallout of the first two classes of the pandemic's economic impact*. This third "attenuated" category would include the massive stabilization and rescue packages enacted by states to shore up their economies during the pandemic.

The *Trail Smelter Arbitration* is not conclusively illustrative on all of these possible classes of economic harm.

First, as part of its calculation of the damages Canada owed the United States (at least up to 1938), the case involved a straightforward consideration of *direct economic losses* resulting from the injury produced by the smelter's fumigations (tangible damage to property or tangible environmental harm). For example, the *Trail Smelter Arbitration* accounted for Americans' loss of economic value in their immoveable property (with respect to its productivity and its resale value) due to the effects of the smelter's pollution.[215] This correlates with the first class of pandemic-induced economic losses identified above and

215. *Trail Smelter I*, 3 R.I.A.A. at 1926 (noting the measure of damages used by the arbitration board includes not only the decrease in crop yield but also "use or rental value").

suggests that it would be a straightforward legal matter (but an immensely complicated actuarial undertaking) to apply the Principle to COVID-19 by categorizing each nation's direct economic losses due to COVID-19.

Second, the *Trail Smelter* tribunal was less receptive to American claims of *indirect economic injury* resulting from the activities at the mill in British Columbia. For example, the Americans complained about a "loss of business" activity in the region as a result of the "reduced economic status" of residents in the area.[216] The Americans argued that the direct harm caused by pollution (direct economic loss) left the region's residents with less money in their pockets to spend in local businesses (indirect economic loss).[217] When renouncing this form of economic harm, the Trail Smelter tribunal raised one legal objection and one factual objection. First, the tribunal found no basis in law for an indemnity for indirect or secondary business losses. They wondered whether alleged economic harm based on the "impoverishment" that resulted from the tangible harm to the environment was "too indirect, remote, and uncertain to be appraised and not such for which an indemnity can be awarded."[218] Second, the arbitrators concluded that, whatever the relevant law might allow, the U.S. had not met the "clear and convincing evidence" standard of proof regarding this alleged injury.[219]

Third, it does not appear that the Trail Smelter tribunal was asked to consider whether attenuated economic costs would constitute a harm under the Transboundary Harm Principle. This would have been relevant if the United States had provided direct support or subsidies to the harmed American farmers as a way of offsetting any direct or indirect costs suffered due to the transboundary pollution. This is the nature of the potential claims of economic harm under the third class of pandemic-induced economic losses (government-provided "rescue packages") identified above.

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216. *Id.* at 1931.

217. *See id.* (exploring the "damage in respect of business enterprises" alleged by the United States government").

218. *Id.*

219. *Trail Smelter II*, 3 R.I.A.A. at 1962 (noting that lack of injury in the United States after October 1937).

The law concerning the first class of economic loss is well-settled. As it involves the damages attributable to the tangible health harm produced by the pandemic, this class can logically be applied to COVID-19. The law concerning the second and third classes of potential economic harm is not clear and requires further research. In light of the immense scale of the costs implicated by these categories of pandemic-induced economic loss, there is reason for a creative interpretation and application of the relevant norms when determining whether to regard those economic losses as actionable harm under the Transboundary Harm Principle.

2. *How Serious Must the Harm Be?*

In line with the elevated evidentiary standard and the somewhat limited spectrum of recognizable harm, the "seriousness" element of the Transboundary Harm Principle also attempts to equitably negotiate the "clash of sovereignties" at the heart of these disputes. The "seriousness" element does this by limiting claims under the Principle to non-trivial injury. In doing so, it preserves a significant measure of a state's sovereign right to use its territory as it wishes by limiting the risk that might incur international law responsibility only to those circumstances involving *serious* transboundary harm.

But the "seriousness" element also reinforces a measure of the harmed state's undisturbed sovereignty over its territory by imposing international law responsibility on the offending state when the transboundary harm suffered is significant. The regime favors the *status quo* right of a state to act—or allow action—in its territory. It favors that commitment but limits it. The question becomes, how is the line between actionable "serious" harm and "trivial" annoyance to be determined? Once again, the *Trail Smelter* case—and the law on which the tribunal relied—is instructive.

(a) *"Seriousness" in U.S. Equitable Appropriation Cases*

The *Trail Smelter* tribunal derived the requirement that the eligible harm be of "serious consequence" from the American equitable apportionment jurisprudence. Those cases consider two factors when determining an injury's seriousness: (1) a balance of the costs and benefits involved in the assertions of sovereignty; and (2) whether the harmful activity constituted a

departure from prevailing standards of conduct or practice. A "serious" transboundary harm is one that involves more costs for the harmed state than benefits for the state in which the harmful conduct takes place. Alternatively, a "serious" transboundary harm is one that involves conduct that is a departure from typical practice.

(i) *Cost-Benefit Analysis*

In *Kansas v. Colorado*, the Supreme Court relied on the first of these factors when it decided not to exercise its apportionment powers to delineate the water rights of Kansas and Colorado over the Arkansas River.[220] Colorado's withdrawal of water from the Arkansas River allowed its residents to reclaim arid lands for agricultural use.[221] But Kansas complained that this new use of the river in Colorado caused "perceptible injury to portions of the Arkansas valley in Kansas."[222] The injury in Kanas consisted of decreased water flows into its irrigation ditches and an attending decrease in agricultural productivity in western Kansas.[223] The Court found that the injury to Kansas's sovereign interests was not significant.[224] The Court explained that the appropriation of water in Colorado caused only modest harm in Kansas while producing great benefits for Colorado.[225] Since each state had the prerogative to use the waters of the Arkansas River for irrigation, the Supreme Court viewed the injuries caused as insufficient to justify a decree.[226]

220. Kansas v. Colorado, 206 U.S. 46, 117 (1907) (balancing the loss of water for Kansas with a large agricultural benefit to the state of Colorado).

221. *Id.* ("the result of that appropriation has been the reclamation of large areas in Colorado, transforming thousands of acres into fertile fields . . . otherwise they would have continued barren and unoccupied").

222. *Id.*

223. *Id.* at 106–14 (exploring the nature of irrigation ditches, land use, and water diminution in western Kansas and Colorado between 1880 and 1904).

224. *Id.* at 113 ("the withdrawal of the water in Colorado for purposes of irrigation has not proved a source of serious detriment to Kansas counties along the Arkansas River.").

225. *Id.* at 113–14 (for the proposition that "some detriment" to Kansas resulted in "great benefit" for Colorado with the opening of new irrigated farmlands).

226. *Id.* at 117 ("regarding the interests of both states, and the right of each to receive benefit through irrigation and in any other manner from the waters of this stream, we are not satisfied that Kansas has made out a case entitling it to a decree.").

The Court, however, left open the possibility of a different assessment should an increase in Colorado's use of the Arkansas River result in the destruction of an "equitable apportionment of benefits between the two states."[227] The *Kansas* case shows that "seriousness" is, in part, a measure of the value proposition involved in any particular transboundary harm context.

(ii) *Prevailing Practices Analysis*

Missouri v. Illinois provides an example of the second "seriousness" analysis.[228] Confronted with evidence that Illinois was polluting the Mississippi River basin with sewage, the Supreme Court explained that it would exercise caution when judging the actions of independent sovereigns.[229] From that posture, the Court noted that, all along its course, it was common to deposit waste into the Mississippi River.[230] It resolved that Illinois' alleged harmful activity was not significant because it conformed to the prevailing standards of conduct on the Mississippi River. The Court observed that Missouri, the complaining state, also engaged in waste dumping on the river.[231] The Court explained: "Where, as here, the plaintiff has sovereign powers and deliberately permits discharges similar to those of which it complains, it . . . offers a standard to which the defendant has the right to appeal."[232] In essence, the Court reasoned that Illinois' discharges cannot be regarded as "serious" if Missouri was engaging in similar conduct. "Seriousness," as an element of the harm required for a claim of transboundary harm, is, in part, determined by the degree to which the challenged activity departs from prevailing standards of conduct. This is especially relevant when the complaining state itself engages in similar activities.

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227. *Id.* at 118.

228. Missouri v. Illinois, 200 U.S. 496, 521–22 (1906) (exploring another seriousness framework).

229. *Id.* at 517 (expressing weariness to involve themselves in matters between two U.S. states given their inherent sovereignty in many affairs).

230. *Id.* at 521–22.

231. *Id.* ("If we are to judge by what the plaintiff itself permits, the discharge of sewage into the Mississippi by cities and towns is to be expected. We believe that the practice of discharging into the river is general along its banks . . . .").

232. *Id.* at 522.

(b) *"Seriousness" and the Trail Smelter Arbitration*

The first of these analyses (the cost-benefit assessment) played an implicit role in the Trail Smelter tribunal's assessment of the seriousness of the harm in that case. The arbitrators' work was colored by their understanding of the economic significance of Trail Smelter to the regional economy and to Canada's national economy.[233] By comparison, the losses suffered by farmers and loggers in the United States as a result of the border-transcending pollution appeared relatively modest. As noted earlier, the arbitrators found that the United States failed to prove harm with respect to a number of its claims, including harm to immoveable urban property (in Northport) and moveable property (livestock, such as milk cows and sheep).[234] Despite those reservations, the tribunal nevertheless found "serious" harm to "cleared land and uncleared land" used for agricultural purposes, and to "uncleared land" used for timber harvests.[235] This justified the tribunal's order requiring Canada to pay an indemnity under the Transboundary Harm Principle. The arbitrators ultimately accepted that there had been "some reduction" in agricultural production in the United States.[236] That does not sound like the tribunal needed to see *substantial* or *significant* harm to satisfy the "seriousness" element. And, in fact, the $78,000 in compensation the tribunal ultimately decreed for those harms—covering the six years from 1932 to 1938—was just a fraction of the $350,000 settlement paid by Canada for the harm suffered in Washington State up to 1932.[237] But adjusting the 1938 award for inflation tells us something, in absolute terms, about the nature of "seriousness" under the Transboundary Harm Principle. At today's value, the 1938 award would be worth close to $1.5 million.[238]

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233. *Trail Smelter II*, 3 R.I.A.A. at 1974 (refusing some suggestions for regulating the Trail Smelter by the United States due to the potential to "unduly and unnecessarily hamper" operations).

234. *Trail Smelter I*, 3 R.I.A.A. at 1931 (refusing to allow damages for property in Northport and to livestock).

235. *Id.*

236. *Id.*

237. *Id.* at 1918, 1931 (noting the $350,000 indemnity paid in 1931 and the $75,000 indemnity from the 1938 decision).

238. Bureau Lab. Stat., Historical Consumer Price Index for All Urban Consumers (CPI-U): U.S. City Average, All Items, By Month, https://www.bls.gov/cpi/tables/supplemental-files/historical-cpi-u-202211.pdf

3. *Serious Harm and the Pandemic*

The COVID-19 pandemic has harmed human life and health to an almost incalculable degree. The harm is ongoing, with no certainty about when it might abate, let alone end. Even if the possibility of indirect and attenuated economic harm is excluded, it is evident that the pandemic's direct harm has been "serious."

This conclusion is supported by both theories advanced by American law that informed the Trail Smelter tribunal's conclusions on this element of a Transboundary Harm claim. First, it is hard to imagine how the benefits to China for maintaining a deficient regulatory framework (relating to food safety or hazardous biological research) could outweigh the immense costs resulting from a devastating pandemic. Second, there is some basis for questioning whether the relevant regulatory frameworks in China (relating to food safety and hazardous biological research) conformed to common practices in those fields, especially as regards the standards of developed countries fully integrated into the world's open trade framework.

There is some evidence that the food safety regime in China does not conform to accepted standards.[239] As one commentator explained, food safety has "become one of the most challenging social issues in China that needs to be addressed. Domestic issues concerning food safety occur more frequently in China than in other countries; there are loopholes in all aspects of the food chain—from the farm to the table."[240] These shortcomings would have extended to the semi-regulated consumption of wildlife that was often acquired at open "wet markets" and which forms the basis of the zoonotic theory of the pandemic's origin. An historical survey of food safety issues and regulation in China that was published in the

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[https://perma.cc/9UPB-4UAX] (last visited Jan. 10, 2023) (based on an April 1938 CPI-U of 14.2 and a November 2022 CPI-U of 297.711, $75,000 at the time of the 1938 Trail Smelter Judgment would be $1,572,417 in November 2022).

239. *See generally* Zhe Liu et al., *Food Safety Governance in China: From Supervision to Coregulation*, 7 FOOD SCIENCE & NUTRITION 4127 (2019) (chronicling the shortcomings of each evolutionary stage of the Chinese food safety system).

240. Yongning Wu & Yan Chen, *Food Safety in China*, 67 J. EPIDEMIOL CMTY. HEALTH 478, 478 (2013).

months prior to the COVID-19 outbreak documented the fact of frequent "food safety incidents" in China and the slow progress in developing a comprehensive national regulatory framework.[241] The authors explained that:

> The food control system in China was not well organized before 2009. In 2008, about 294,000 infants were diagnosed with urinary calculus, and more than 50,000 were hospitalized, while six infants died (MOH, 2008). The first Food Safety Law was released by the Chinese government in February 2009 and implemented in June of the same year. The Food Safety Law has been delayed for a long time, due to the development of various versions of the law by several major regulatory departments, resulting in lack of consensus. The concept of "Healthy China" was proposed at the 19th National Congress of the Communist Party of China in 2017. In the proposal, China is expected to improve the national health policy and the system for medicine supply, thereby promoting healthy and positive lifestyles, and initiating a food safety strategy to ensure that people have confidence in the food they eat.

The article's authors reported that the effectiveness of food safety reforms enacted in 2009 and 2015 were undone by the patchy "intermediary management of the current regulatory system."[242] The authors suggested that local governments had not lived up to their responsibilities in "providing unified leadership, organization, and coordination of food safety supervision and management of the administrative regions, as well as food safety emergency responses, supervision and management mechanism, and information sharing mechanism."[243] Highlighting the risks posed by wildlife consumption, the authors noted that, among other persistent challenges, a significant number of "food safety incidents" involved "materials and products that are sold outside the general requirements for food labeling" or implicated "pathogenic microorganisms."[244]

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241. Liu, *supra* note 239, at 4128 (listing some of the prominent food safety scandals in China over the last two decades).

242. *Id.* at 4129.

243. *Id.* at 4131–32.

244. *Id.* at 4132.

The article concluded that "China is still in the risk-prone period of food safety."[245] The systemic deficiency in food safety regulation in China has been the subject of extensive reporting, including news that, after the COVID-19 outbreak, China had at last banned the consumption of wildlife.[246] In 2021, explicitly invoking the COVID-19 pandemic, the World Bank approved a $400 million loan in support of the China Food Safety Improvement Project.[247]

There is also some evidence that the biosafety regime maintained at the Wuhan Institute of Virology did not conform to best practices. This would be the basis of the "lab leak" theory of the pandemic's origin. The concern surfaced when media reports revealed that American diplomats had documented safety issues at the laboratory in 2018. The diplomatic reports sent back to Washington, D.C., noted that Chinese researchers at the Wuhan lab complained that "they didn't have enough properly trained technicians to safely operate their [ultrahazardous] lab."[248] The revelation of these early warnings, that seem to have gone unheeded, added to the U.S. government's apprehension that more needed to be done regarding safety at the Wuhan facility and that the lab was saddled with "real safety problems."[249] The regulatory deficiency at the Wuhan lab would have been part of a broader problem. Worry about pathogens escaping from the new ultrahazardous facility in Wuhan built on the record of several previous SARS leaks from Beijing laboratories and on the lack of an open research culture in China that would foster safety innovation and re-

245. *Id.* For further exploration of food safety regimes in China and some allegations of failings, see Yunxiang Yan, *Food Safety and Social Risk in Contemporary China*, 71 J. ASIAN STUD. 705 (2012); John Kojiro Yasuda, *Why Food Safety Fails in China: The Politics of Scale*, 223 CHINA Q. 745 (2015).

246. *See supra* note 182 (all exploring wet markets in China and the actions China took against them in response to the COVID-19 pandemic).

247. Press Release, *Advancing China's Food Safety*, WORLD BANK (Mar. 25, 2021), https://www.worldbank.org/en/news/press-release/2021/03/25/advancing-china-s-food-safety [https://perma.cc/HT73-DDXP].

248. Josh Rogin, *In 2018, Diplomats Warmed of Risky Coronavirus Experiments in a Wuhan Lab. No One Listened*, POLITICO (Mar. 8, 2021), https://www.politico.com/news/magazine/2021/03/08/josh-rogin-chaos-under-heaven-wuhan-lab-book-excerpt-474322 [https://perma.cc/S5U5-GV33].

249. *Id.* ("More should be done to help the lab meet top safety standards, [the diplomats] said, and they urged Washington to get on it.").

porting.[250] One article reported a "pressing need to improve the regulatory standards" applied to dangerous biological research in China.[251] The article also documented problems in the implementation of biosafety at China's hazardous labs, including techniques and equipment that were behind western standards, a lack of "acute evaluation criteria and schemes," and a lack of well-trained and experienced biosafety specialists.[252] The last of these deficiencies was precisely the concern that had been raised in the reports submitted by the American diplomats.[253] The article concluded that "a comprehensive system of legal and regulatory standards is lacking for . . . laboratories in China."[254]

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250. David Cyranoskix, *Inside the Chinese Lab Poised to Study the World's Most Dangerous Pathogens*, NATURE 599 (2017). In an academic article published just before the outbreak, the Chief Expert of Biosafety at the Chinese Center for Disease Control and Prevention expressed grave concern about the biosafety systems in place at China's hazardous biological laboratories. Guizhen Wu, *Laboratory Biosafety in China: Past, Present, and Future*, 1 BIOSAFETY & HEALTH 56, 56–58 (2019) (exploring Chinese laboratory biosafety mere months before the COVID-19 pandemic in September 2019). This was no small matter, as the author has been credited with "working for nearly four decades in the field of public health emergencies and laboratory biosafety" and is recognized as "the major planner and promoter of the laboratory biosafety management system in China." Peter Hao et al., *Profiles: Guizhen Wu, China CDC's Chief Expert of Biosafety*, CHINA CDC WEEKLY (Sept. 11, 2020), https://weekly.chinadc.en.article/doi/10.46234/eedew 2020.198?pageType=EN.

251. Wu, *supra* note 250, at 58.

252. *Id.*

253. *See* Rogin, *supra* note 248 (noting a message sent by the United States Embassy in Beijing of the facilities given "a serious shortage of appropriately trained technicians and investigators needed to safely operate [the] high-containment laboratory").

254. Wu, *supra* note 250, at 57. *But see* Michelle Fay Cortez, *The Last – And Only – Foreign Scientist in the Wuhan Lab Speaks Out*, BLOOMBERG BUS. (June 27, 2021, 5:00 PM), https://www.bloomberg.com/news/features/2021-06-27/did-covid-come-from-a-lab-scientist-at-wuhan-institute-speaks-out [https://perma.cc/K8RN-Y3E5] (reporting on the experience of an Australian researcher at the Wuhan lab who claimed that the safety regime featured impressive infrastructure and intensive, "very, very extensive" safety training).

C. *Was the Harm Caused by Activity Occurring in the Territory of Another State?*

1. *Causation and the Trail Smelter Arbitration*

Causation was a central—maybe *the* central—factual issue in the *Trail Smelter Arbitration*. As noted earlier, the case was concerned with harm occurring after 1932 up to the date of the Tribunal's first decision in 1938.[255] The Tribunal's 1941 decision did not have to address the issue of causation because it found that the United States failed to prove that any serious harm had occurred in the state of Washington after 1938.[256] To confuse matters regarding this material element of the Transboundary Harm Principle, the arbitrators' treatment of the issue of causation in the 1938 decision sometimes conflated several of the questions the tribunal was charged with answering, including the existence of a serious injury; whether the smelter in Canada was the cause of that harm; and the valuation of the indemnity, if any, that should be ordered as compensation for the harm.[257] Often, the same evidence informed each of these inquiries.

Despite that lack of clarity, it is possible to divine the arbitrators' approach to the Transboundary Harm Principle's causation element. This consisted of the collection and independent consideration of extensive scientific data as well as lay testimony. The tribunal had the benefit of evidence developed through cooperative means, as had been mandated by the Special Agreement between the U.S. and Canada.[258] The parties also contributed evidence—or advocated a particular interpretation of evidence—in an adversarial manner.[259]

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255. *Trail Smelter I*, 3 R.I.A.A. at 1908 (stating that the Trail Smelter Tribunal is to determine damage that have "occurred since the first day of January 1932", leaving the issue of damages after the date of the Tribunal's decision to regulatory "measures or régime").

256. *Trail Smelter II*, 3 R.I.A.A. at 1962 (holding that no damage has occurred since October 1937).

257. *Trail Smelter I*, 3 R.I.A.A. at 1908 (listing questions 1, 2, and 4 from Article III of the 1935 Special Agreement).

258. *Id.* at 1908–09 (Article V through VIII of the 1935 Special Convention, setting out a process for evidence gathering and means to challenge claims in an adversarial manner).

259. *Id.* at 1921–22 (noting how both the United States and Canada provided evidence and experts that frequently had contrary views and conclusions).

To begin, the arbitrators seemed to take notice of the fact that the Sulphur dioxide fumigations resulting from Trail Smelter's massive industrial activities could be the cause of property and environmental harm, especially in the form of "smoke damage" to crops and timber, as well as fungal "rusting" damage to vegetation.[260] A primary proof of this phenomenon took the form of the smelter's seeming concession on this point in earlier proceedings (both domestic and international) in the case. The arbitrators took notice of this factual background, concluding that "from 1925, at least, to the end of 1931, damage occurred in the state of Washington, resulting from the Sulphur dioxide emitted from the Trail Smelter."[261] From this, it seemed settled that the smelter's fumigations were injurious to property and the environment. The fact of Canada's failure to prevent the harmful activity by adequately regulating it could be taken for granted by the tribunal. The real issues of causation became whether the smelter's harmful fumigations were reaching the U.S. and to what degree the harmful effects of the smelter's smoke were mitigated by distance from the source and climatic conditions in the Columbia River valley.[262]

The *Trail Smelter Arbitration* involved a considerable amount of new evidence relating to the causes of the serious harm it confirmed in the years from 1932 to 1938. The new evidence of causation presented to the arbitrators was extensive, varied, and complex. It included data from investigations jointly approved by the parties, such as emissions monitoring at Trail Smelter that sought to assess the nature, duration, and concentration of Sulphur fumigations.[263] The tribunal concluded that these investigations had high "scientific value" as regards the question of causation.[264] Other evidence of causa-

260. *See id.* at 1925–27 (asserting various effects of the smoke damage on American properties, including to crops, soil, and forests).

261. *Id.* at 1917.

262. *Id.* at 1922 (noting the dispute between Canada and the United States that the fumigations were crossing the border and that even if such fumigations existed, that there was dispute to whether or not that actually caused damage in the United States due to the nature of the Columbia River valley).

263. *Id.* at 1921 (noting that sulfur dioxide recorders installed by the United States and Canada provided valuable recording data for its 1938 decision).

264. *Id.*

tion presented to the tribunal included expert and lay testimony. The arbitrators noted, however, that this testimony was sometimes inconclusive as the all-too-common clash of experts could point in opposite directions.[265]

The various sources of evidence and the spotty quality or inconclusiveness of some of the science presented to the tribunal made it difficult for the arbitrators to conclude that the smelter caused the confirmed damage in the United States. The problem for the tribunal was that the evidence seemed to suggest that there had been episodic, scattered, and diminishing fumigations south of the border.[266] This led the arbitrators to reject the theory of causation that had preoccupied both parties in the dispute. Instead of attributing the harm in the United States to Sulphur dioxide carried across the border by "surface winds," the tribunal turned its attention to evidence suggesting that the harmful smoke was carried into the United States by the "upper air currents."[267] The arbitrators noted that fumes from the tall smoke stacks at the smelter enter "upper air currents, and are carried by these currents in a fairly continuous stream down the valley . . . [and] that the velocity and persistence of the upper air currents is greater than that of the surface winds."[268] The evidence supporting this theory allowed the tribunal to conclude that "the upper air currents are a likely cause of the depositing of [harmful] Sulphur dioxide in the U.S."[269]

But that conclusion on causation in the case was not the end of the tribunal's assessment. It went on to account for "the rate of attenuation of concentration of Sulphur dioxide with increasing distance from the smelter."[270] The arbitrators demarcated the farthest geographic extent and the general in-

265. *Id.* (noting the wide disagreement of American and Canadian experts on the cause of damage to timberlands).

266. *Trail Smelter II*, 3 R.I.A.A. at 1969–70 (looking at the seasonal, daily, and other environmental impacts on fumigations from the Trail Smelter).

267. *Trail Smelter I*, 3 R.I.A.A. at 1923.

268. *Id.* at 1924.

269. *Trail Smelter II*, 3 R.I.A.A. at 1945 (By 1930 the stacks were pumping about 350 tons of Sulphur dioxide into the air each day. The smelter added smokestacks rising above 400 feet in 1925 and 1927. This permitted the smelter to significantly increase production with the effect that more Sulphur dioxide fumes were emitted in higher concentration higher-up in the air).

270. *Trail Smelter I*, 3 R.I.A.A. at 1924.

tensity of the damage in the United States caused by the smelter's fumigations. Within these parameters, the tribunal found that the smelter's smoke was the cause of reduced crop yields in varying degrees in 1932 through 1937.[271] Some of this damage, the tribunal concluded, rose to the level of seriousness under the Transboundary Harm Principle and therefore merited indemnification.[272]

2. *Causation and the Pandemic*

The *Trail Smelter Arbitration's* engagement with the question of causation featured a narrowing of the issue, an independent review of the scientific evidence, and an accounting of the attenuating and mitigating factors related to causation. This framework is instructive for the resolution of the issue of causality in the application of the Transboundary Harm Principle to the COVID-19 pandemic, not the least because it reaffirms the cautious and proportional approach the Trail Smelter tribunal envisioned for the application of the Principle.

First, it shows that it is possible to resolve this element in a manner that does not require a definitive settlement of the origin of the outbreak of the pandemic in China. As discussed earlier in this article, the debate over origin is now focused on the zoonotic theory and the laboratory leak theory.[273] But both of these *ex ante* theories can be framed as a form of regulatory failure on the part of China, in the same way that Canada's regulatory disregard for the smelter served as the underlying cause for the transboundary harm in the *Trail Smelter Arbitration.*

The zoonotic theory would involve a broad range of acts and omissions that may have created the conditions for the emergence of COVID-19. The essence of this theory is that the Chinese government has moved slowly to establish an effective

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271. *Id.* at 1926 (noting damages for "years 1932 to 1937 inclusive").

272. *Id.* at 1931 (awarding $62,000 as an indemnity with respect to damages to "cleared land and uncleared land. . . [not] used for timber").

273. *E.g.*, *Covid Origin: Why the Wuhan Lab-Leak Theory is Being Taken Seriously*, B.B.C. NEWS (May 21, 2021), https://www.bbc.com/news/world-asia-china-57268111/ [https://perma.cc/4SL5-4FVH] (exploring the Zoonotic and Lab Leak theories).

food safety regulatory regime.[274] The food safety framework in China is only gradually catching up to the conditions in any of its modern, developed trading partners.[275] Not surprisingly, China's less effectively regulated food and drug market has produced several health crises. The risks in this arrangement—for China and the rest of the world—have been proven in the past, for example: with the 2002 SARS crisis, with the 2008 milk production scandal, and with the 2009 H1N1 crisis.[276]

According to the zoonotic theory of the origin of the outbreak, the unregulated sale and consumption of wildlife in China was the cause of the pandemic. The journal *Scientific American* and other sources have reported on the possibility that wild pangolins sold for consumption in Wuhan were the intermediate carrier of the coronavirus that most likely originates in the region's bats.[277] In a tacit admission that the

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274. See, *e.g.,* David J. Ettinger et al., *China Publishes Long-Awaited Food Safety Law Implementation Regulation*, NAT'L L. REV. (Nov. 5, 2019), https://www.natlawreview.com/article/breaking-news-china-publishes-long-awaited-food-safety-law-implementation-regulation/ [https://perma.cc/RWS4-7YAT] (exploring the regulatory implementation of a new food safety regime within the People's Republic of China); David J. Ettinger et al., *China Publishes Long-Awaited Food Safety Law Implementation Regulation*, NAT'L L. REV. (Sep. 21, 2017), https://www.natlawreview.com/article/cfda-submits-to-wto-third-revised-draft-regulation-implementation-food-safety-law [https://perma.cc/DJU3-7FSU] (noting that the original draft for the Food Safety law dated back to 2015).

275. Junshi Chen & Chunzhu Wu, *An Update of China's Food Safety Regulatory Framework*, REGUL. AFF. PROF. SOC'Y (July 2022), https://www.raps.org/RAPS/media/news-images/Feature%20PDF%20Files/22-7_Chen.pdf/ (exploring recent updates to the food safety in China and comparing it to the Codex standard and other developed countries).

276. *See* Rebecca Onion, *We've Had a Lot of Pandemics Lately. Have We Learned Anything From Them?*, SLATE, (Jan. 30, 2020, 11:29 AM), https://slate.com/human-interest/2020/01/coronavirus-outbreak-sars-swine-flu-viral-history.html [https://perma.cc/NAW8-L265] (discussing the 2002 SARS crisis and 2009 H1N1 crisis); Yanzhong Huang, *The 2008 Milk Scandal Revisited*, FORBES (Jan. 16, 2014, 10:46 AM), https://www.forbes.com/sites/yanzhonghuang/2014/07/16/the-2008-milk-scandal-revisited/#7a634dbf4105/ [https://perma.cc/V87L-MW7G] (exploring China and its connection to various regional and global health scares).

277. Jane Qiu, *How China's 'Bat Woman' Hunted Down Viruses from SARS to the New Coronavirus*, SCIENTIFIC AMERICAN (June 1, 2020), https://www.scientificamerican.com/article/how-chinas-bat-woman-hunted-down-viruses-from-sars-to-the-new-coronavirus1/ [https://perma.cc/VN6V-AHNC].

unregulated market for wildlife meat was an avoidable cause of the crisis, in late February 2020, the Chinese government "announced a permanent ban on wildlife consumption and trade."[278] The *Scientific American* report suggests that the Chinese government begrudgingly adopted the ban because it will "stamp out an industry worth $76 billion" that involves "approximately 14 million" laborers.[279]

The laboratory leak theory involves allegations that China inadequately regulated and secured the Wuhan laboratory that was engaged in extensive and highly dangerous research on Coronaviruses.[280] Regarding causation, however, there is one distinction to be drawn with respect to the laboratory leak theory. If the evidence points in this direction, then it may be possible that the specific international law regime applicable to Transboundary Harm Resulting from Hazardous Activity should apply. Given the lack of negligence or fault required, this would involve a more permissive evidentiary standard that approaches strict liability.[281]

Both of these theories involve forms of regulatory failure and are analogous to the *Trail Smelter Arbitration*. The Trail Smelter dispute concerned the allegation that Canada had failed to regulate the smelter's environmental impact in a manner that would have prevented spreading the pollution to the United States. The argument with respect to the COVID-19 pandemic would be similar. First, the allegation would be that the Chinese government's failure to more effectively regulate its food market—especially the failure to regulate the sale and consumption of wildlife—was a cause of the emergence of the virus. Second, the allegation would be that the Chinese government's failure to adequately secure the dangerous research on Coronaviruses at the Wuhan laboratory permitted the leak of the pathogen. Both prevailing theories relating to the pandemic's outbreak involve significant regulatory failure. Framed in this way, the question of causation in the context of

278. *Id.*

279. *Id.*

280. *See generally* Felter, *supra* note 177 (noting and looking into Chinese research into coronaviruses).

281. *See* Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, *supra* note 42, at 146, art. 1 (noting that the regime covers "activities not prohibited by international law which involve a risk of causing significant transboundary harm through their physical consequences").

the COVID-19 pandemic would be: (1) whether China's harmful activity (regulatory failure as it relates to the zoonotic theory or laboratory leak theory) spread beyond its borders, and (2) to what degree the harmful effects of the spread were attenuated in some way.

D. *The Remedy for Transboundary Harm*

A final significant lesson from the *Trail Smelter Arbitration* involves the remedy the tribunal granted the United States. The tribunal's carefully calculated award included three components that will be familiar to public international law specialists, even if the arbitrators primarily referred to the American law of remedies to guide their decision-making on these issues.[282] The award included a demand that Canada cease the harmful activity (smelting processes causing the pollution that drifted in the United States);[283] an order for damages to be paid as compensation for the harm caused in the state of Washington;[284] and an order establishing a regulatory and monitoring regime providing assurances of non-repetition.[285] The arbitrators' final award is particularly relevant to the application of the Transboundary Harm Principle to the pandemic. But the details of the *Trail Smelter Arbitration* remedy—the process the tribunal used and the remedial conclusions it reached—may not have achieved customary international law status in the same way that the material elements of the Transboundary Harm Principle have. Still, a robust body of law and commentary around state responsibility has developed in the meantime, supporting the above as the appropriate framework for assessing and enforcing a remedy for the transboundary harm caused by the COVID-19 pandemic.

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282. *See Trail Smelter I*, 3 R.I.A.A. at 1933–36 (first awarding the United States a $78,000 indemnity, then ordering the Trail Smelter to cease causing damage in the state of Washington, and then finally ordering the installation of a temporary regulatory and monitoring regime).

283. *Id.* at 1933–34.

284. *Id.* at 1934 (ordering that the "Trail Smelter shall refrain from causing damage in the State of Washington in the future" until the establishment of a permanent regime).

285. It was so ordered that a temporary regulatory and monitoring regime be installed, then eventually a permanent regime be established. *Id.* at 1935–36; *Trail Smelter II*, 3 R.I.A.A. at 1974–78.

Several key principles emerged from the arbitrators' efforts to devise a remedy in the *Trail Smelter* case. First, the tribunal considered and imposed remedies that are now part of the well-settled regime for state responsibility in international law. For example, the award consisted of the obligation to cease the harmful activity and to provide reparations for the harm done.[286] Second, the tribunal acted proportionally when fashioning a "solution just to all parties."[287] Third, the arbitrators developed exceedingly detailed and deep evidence about the dispute, an effort that spanned several years of research and monitoring.[288] The tribunal used that information in its consideration of the substantive rights of the parties (including the issues of causation and harm). The arbitrators also relied on that painstaking evidence to assess and determine the extent of the remedy the tribunal would award. Yet, for all of this rigor and restraint regarding the remedy, the arbitrators insisted that difficulties in making an accurate financial assessment of the harm would not preclude a judgement awarding compensation.[289] Fourth, the arbitrators took notice of the American farmers' practices that may have exacerbated, or at least failed to mitigate, the harm they suffered.[290] This introduced an element of contributory responsibility into the tribunal's assessment of the damages that once again reaffirms the cautious and proportional character of the rule applied by the Trail Smelter tribunal. Finally, the tribunal imposed a detailed regulatory regime on the Canadian smelter—and maintained its supervisory authority over that regime—as a way of ensuring that there would be no repetition of the harm.[291]

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286. *Trail Smelter I*, 3 R.I.A.A. at 1934; *Trail Smelter II*, 3 R.I.A.A. at 1966 (answering Question 1 with a $78,000 financial reparation and Question 2 with the temporary regime to "refrain from causing damage in the State of Washington").

287. *Trail Smelter I*, 3 R.I.A.A. at 1908 (from the 1935 Special Convention, Article IV).

288. *Trail Smelter II*, 3 R.I.A.A. at 1946–48 (exploring the experiments and data recording taking place from 1931 to 1937 and 1937 to 1941).

289. *Trail Smelter I*, 3 R.I.A.A. at 1929 (noting that the difficulties in ascertaining damage within "any degree of accuracy" did not preclude fiscal consideration by the Tribunal).

290. *Id.* at 1925 (specifically noting the failure of American farmers to increase the seeded land to mitigate damages in the impacted area).

291. *Trail Smelter II*, 3 R.I.A.A. at 1974–78 (covering the monitoring and emissions regime of the Trail Smelter).

1. *Remedial Lessons from Trail Smelter*

The *Trail Smelter Arbitration* award was announced in the tribunal's two judgements.

In the 1938 decision, the arbitrators ordered a final award of $78,000 as compensation for the significant harm caused by the Trail Smelter in the United States during the years 1932-1938.[292] In settling on that amount, the arbitrators considered direct damage to a wide range of environmental conditions and property interests, such as the reduced value of farmland, injury to the soil, damage done to cleared land (not used for crops) and uncleared land (not used for timber harvests), and losses associated with timberland.[293] In each of these cases, the tribunal relied on the specific "measure of damages" that would have been available under American law.[294] The tribunal acknowledged, however, that it could not "ascertain[ ] . . . the amount of damages with certainty."[295] Even so, the arbitrators settled on a value for the damages because, to forego compensation in those uncertain circumstances would be a "perversion of fundamental principles of justice."[296] It was permissible, the tribunal explained, to reach a "just and reasonable inference" about the compensation to be paid.[297] Finally, in the 1938 judgement, the tribunal ordered a temporary—very detailed—regulatory and monitoring regime at the Trail Smelter aimed at preventing the mill from causing further damage in the United States and to develop the scientific evi-

292. *Trail Smelter I*, 3 R.I.A.A. at 1933 (establishing the indemnity of $78,000 plus six percent interest per annum).

293. *Id.* at 1920 (considering the following categories for damages "(a) Damages in respect of cleared land and improvements thereon; (b) Damages in respect of uncleared land and improvements thereon; (c) Damages in respect of livestock ; (d) Damages in respect of property in the town of Northport; (g) Damages in respect of business enterprises.").

294. *Id.* at 1926, 1928 (using the measures for indemnity covered by American law).

295. *Id.* at 1920 (quoting Story Parch. Co. v. Paterson Parch. Paper Co., 282 U.S. 555, 563 (1931)); *Id.* at 1930 (expressing the difficulties in ascertaining damages).

296. *Id.* at 1920 (quoting Story Parch. Co. v. Paterson Parch. Paper Co., 282 U.S. 555, 563 (1931)).

297. *Id.* (quoting Story Parch. Co. v. Paterson Parch. Paper Co., 282 U.S. 555, 563 (1931)).

dence the arbitrators would need to issue a final award in the case.[298]

The final award in the case was announced in a judgement from 1941.[299] In the 1941 decision, the tribunal found that the United States failed to satisfactorily prove the material elements of the Transboundary Harm Principle for harm alleged to have occurred in Washington state between 1937 and 1941.[300] The arbitrators, therefore, refused to award the additional $35,000 in compensation requested by the United States.

Nevertheless, the 1941 decision is instructive on the issue of remedy. First, because the arbitrators took the occasion to emphasize the equitable nature of the remedy they would order. The equitable nature of their work was demanded by the Special Agreement that established the tribunal. Article IV of the Convention called for a "solution just to all parties."[301] The tribunal identified the equal interests it would have to balance in the case: America's interest in a just and adequate indemnity for proven damage in its territory, and Canada's interest in avoiding liability for unproven, unwarranted claims, as well as in seeing the smelter continue in service in some form.[302] Put another way, the remedy would have to ensure that it did not limit industry by exaggerating America's interests, while preventing Canada from continuing to "oppress" its southern neighbor.[303] In the specific context of the *Trail Smelter Arbitration*, this proportional approach meant the tribunal would have to allow Trail Smelter to continue to operate, but under restrictions that would prevent further damage and allow for indemnity if damage nevertheless occurred.[304]

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298. *Id.* at 1934–36 (establishing a temporary regime to govern emissions at Trail Smelter).

299. *See generally Trail Smelter II*, 3 R.I.A.A. at 1938–81.

300. *Id.* at 1959 (concluding that "the United States has failed to prove that any fumigation between October 1, 1937, and October 1, 1940, has caused injury to crops, trees or otherwise.").

301. *Trail Smelter I*, 3 R.I.A.A. at 1908.

302. *Trail Smelter II*, 3 R.I.A.A. at 1938–39 (weighing and balancing Canadian and American concerns).

303. *Id.* at 1939 (expressing that industry and agriculture should not impress on one another, but work together for prosperity).

304. *Trail Smelter II*, 3 R.I.A.A. at 1980.

The remedial portion of the 1941 judgement focused on the regime the tribunal ordered for monitoring and regulating the smelter's operations to ensure that it would cause no harm in the United States in the future. The permanent framework announced by the tribunal called for monitoring at the smelter and in the affected region.[305] It also imposed restrictions on emissions that took account of the season, the time of day, and variable meteorological phenomena.[306] But even while acknowledging that Canada was obliged to refrain from causing *any* damage in the United States, the tribunal conceded that the regulations it ordered would not—indeed, could not—enforce that duty in absolute terms.[307] In the cautious and proportional spirit of the case, the arbitrators accepted that the regime will "*probably* remove the causes of the present controversy" and "*probably* result in preventing any damage of a material nature."[308] The tribunal sought to strike a balance between allowing the mill to function while providing assurances of the non-repetition of the harm to the U.S.

2. *Echoes of Trail Smelter in the State Responsibility Framework*

The customary international law rules for state responsibility codified in the ILC's Draft Articles will provide the remedial framework for an application of the Transboundary Harm Principle to the pandemic. It is important to note, however, that many of the principles that emerge from the *Trail Smelter* remedy find echoes in that framework. Dinah Shelton noted, for example, that the state responsibility regime embraces all the elements of the *Trail Smelter* award, including cessation, compensation, and assurances of non-repetition.[309] She also noted the proportional character of the remedies the state responsibility regime prescribes. The scheme, she explained, in-

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305. *Id.* at 1974–78 (covering the monitoring and emissions regime of the Trail Smelter).

306. *Id.* at 1975–76.

307. *Id.* at 1980 (noting that the "desired and expected result" may not necessarily occur, leading to the need of future damages after October 1940 to be governed by a new convention between the United States and Canada).

308. *Id.* (emphasis added).

309. Dinah Shelton, *Remedies and Reparation*, *in* GLOBAL JUSTICE, STATE DUTIES: THE EXTRATERRITORIAL SCOPE OF ECONOMIC, SOCIAL, AND CULTURAL RIGHTS IN INTERNATIONAL LAW 367, 374 (Langford et. al eds. 2013).

corporates "an element of proportionality" that takes equitable account of the community's interests and the interests of injured parties.[310] Shelton concluded that adjudicators have some discretion under the rules of state responsibility to balance interests and to issue an order that merely "lessens the likelihood of future conflicts" rather than categorically precluding harm.[311] Finally, Shelton acknowledged that the state responsibility regime would struggle to provide and implement rules for ascertaining damages for all possible harm, especially immaterial injuries.[312] This challenge, she explained, should not preclude the effort of fashioning a remedy, even if it means turning to a comparative law analysis of relevant national rules addressing the evolving concept of "financially assessable damage."[313] Of course, that is exactly the approach the *Trail Smelter* tribunal took with its repeated reliance on the "measure of damages applied by American courts."[314]

Shelton took violations of international environmental law as an insightful example for the application of international law remedies. Not surprisingly, she pointed to the *Trail Smelter Arbitration* as a model for the kind of remedies—regulatory and compensatory—that should be considered in the case of transboundary harm.[315] "[T]he rationale [invoked in the *Trail Smelter Arbitration*] for imposing State responsibility to prevent and remedy transboundary harm," Shelton concluded, "is broad enough to extend to transnational conduct beyond environmental matters."[316]

3. *The Remedy for the COVID-19 Pandemic*

The state responsibility framework, often incorporating elements of the *Trail Smelter* tribunal's effort to fashion a remedy, should guide the challenging work of developing a rem-

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310. *Id.* at 375.

311. Dinah Shelton, *Righting Wrongs: Reparations in the Articles on State Responsibility*, 96 AM. J. INT'L L. 833, 852 (2002).

312. *Id.* at 851–53 (noting that the model would struggle to set a framework for consistent compensation, instead focusing on the commentaries emphasis on trying to reach an equitable end).

313. Shelton, *supra* note 311, at 845.

314. *Trail Smelter I*, 3 R.I.A.A. at 1926.

315. Shelton, *supra* note 309, at 388 (exploring Trail Smelter as a model for international environmental law).

316. *Id.*

edy in the event that the COVID-19 pandemic comes to be regarded as a violation of the Transboundary Harm Principle.

An award would require the cessation of the activity that caused the pandemic.[317] On the theory that the outbreak was the result of a zoonotic leap from infected animals to humans, the likely proximate cause of those events would be inadequate or inadequately enforced food safety regulations in China, including rules that permitted the consumption of wildlife. A new framework for regulating and monitoring food safety, perhaps outlined in considerable detail, could be ordered. On the theory that the outbreak was the result of a leak from an experimental laboratory, the order might point to the full implementation of existing safety frameworks but also impose new possibilities for monitoring and improved enforcement. As in the *Trail Smelter Arbitration*, these regimes should be developed with the benefit of nearly-exhaustive evidence.[318] There should be some form of independent verification built into the regime, both to ensure compliance but also to permit adaptation as circumstances require, including even the eventual retirement of the regime if that were to become justified.[319] In this context, the perfect should not become the enemy of the good. Especially out of respect for the universal, natural processes usually involved in the emergence of a viral outbreak, it is worth recalling the *Trail Smelter* tribunal's concession that it could not develop a regime that would absolutely guarantee cessation and non-repetition. It will be enough if the regulatory framework imposed would "*probably* remove the causes of the present controversy" and "*probably* result in preventing any damage of a material nature."[320] In this way, the remedy would strike a balance between the world community's interests in avoiding future pandemics and

317. *See Trail Smelter I*, 3 R.I.A.A. at 1908 (the Trail Smelter Tribunal had to answer the questions of "what measures or régime, if any, should be adopted or maintained by the Trail Smelter?").

318. *See Trail Smelter II*, 3 R.I.A.A. at 1973 (describing the evidence on which it relied when fashioning the award in the Trail Smelter Arbitration as "probably the most thorough study ever made of any area subject to atmospheric pollution by industrial smoke.").

319. *See id.* at 1978 (allowing for an amendment or suspension of the permanent regime after 21 months).

320. *Id.* at 1980 (emphasis added).

China's justified desire to avoid unnecessary intrusions on its sovereignty.

As difficult as it would be to frame the injunctive relief in the case, fixing the compensation owed for the immense, direct, world-wide harm done by the COVID-19 pandemic would present challenges of a different magnitude altogether. Providing just a sampling of the issues that would plague an attempt to calculate and enforce an award for compensation demonstrates the immense challenge posed by calculating a remedial award. How should the loss of life, now approaching a likely total of between 16.3 and 28.4 million deaths,[321] be financially ascertained? How should the non-fatal ill-health, of varying degrees of severity and longevity and involving hundreds of millions of infections, be financially quantified? What about non-material damages that are directly linked to the health effects of the virus, such as lost affection resulting from the death of loved-ones, lost income due to the inability to work, and medical costs? And if the argument could be made that the remedy should address indirect or attenuated economic harm, then how should those costs be calculated? They would include the costs resulting from measures taken by governments to mitigate and constrain the spread of the virus or to shore up their economies because of the disruption caused by the virus. At a macro-economic level this would include trillions of dollars of stimulus programs providing welfare support, aid to businesses, and massive public health programs.[322] It might even extend to follow-on economic consequences of governments' COVID-19 policies, such as the disruption of global supply chains and perhaps even the costly recent spike in inflation.[323]

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321. *The Pandemic's True Death Toll, supra* note 8.

322. *See* Hanna Ziady, The Global Economic Bailout is Running at $19.5 Trillion. It Will Go Higher, C.N.N (Nov. 17, 2020, 10:47 AM), https://www.cnn.com/2020/11/17/economy/global-economy-coronavirus-bailout-imf-annual-report/index.html/ [https://perma.cc/R9Y5-BWRC] (establishing $12 trillion spent in stimulus measures worldwide as of October 2020); Alan Rappeport, *U.S. National Debt Tops $30 Trillion as Borrowing Surged Amid Pandemic,* N.Y. TIMES (Feb. 1, 2022), https://www.nytimes.com/2022/02/01/us/politics/national-debt-30-trillion.html/ [https://perma.cc/3GCN-QCS3] (noting $5 trillion spent in COVID aid packages by the U.S. Federal government).

323. For discussions of the effects on supply chains and inflation, see Mattias Hedwall, *The Ongoing Impact of COVID-19 on Global Supply Chains*, WORLD

A remedy also should account for the disproportionate harm the pandemic has done in the developing world.[324] On an interpersonal level, this would include the economic, human capital (especially eroding education achievement resulting from the disruption of schooling), and health effects of prolonged lockdowns and other restrictions (touching on both physical and emotional harm).[325] How should the harmed States' poor policy decisions, which amplified all of these costs in many cases, be valued and factored into a judgement to offset the compensation to be paid by the state causing the harm? What process and institutions would be necessary to ascertain these costs and administer the payment of compensation?

In light of the daunting actuarial exercise that would be required to fashion a remedy for the border-transcending harm, it is worth recalling a few of the principles that informed the *Trail Smelter* remedy. For example, the effort should be informed by the best available evidence. The *Trail Smelter Arbitration* provided that the parties shared most of the costs of developing the necessary evidence.[326] At the same time, extreme difficulty in developing certainty about any of the issues involved should not justify an abandonment of the effort to order compensation in the case. It would be "a perversion of fundamental principles of justice" and oblige the harmed states (and their citizens) to bear a terrible externali-

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ECON. F. (June 22, 2020), https://www.weforum.org/agenda/2020/06/ongoing-impact-covid-19-global-supply-chains/ [https://perma.cc/FVX6-Q9V9]; Christopher Rugaber, *Key inflation gauge hit 6.1% in January, highest since 1982*, WASH. POST (Feb. 25, 2022), https://www.washingtonpost.com/business/key-inflation-gauge-hit-61percent-in-january-highest-since-1982/2022/02/25/736d2f12-9640-11ec-bb31-74fc06c0a3a5_story.html/ [https://perma.cc/W2A4-TKFC].

324. *See* Indermit Gill & Phillip Schellekens, *COVID-19 is a Developing Country Pandemic*, BROOKINGS (May 27, 2021), https://www.brookings.edu/blog/future-development/2021/05/27/covid-19-is-a-developing-country-pandemic/ [https://perma.cc/RYR3-ZPDA] (noting the damage that COVID-19 has done in developing countries around the world).

325. *See* MATTEO BONOTTI & STEVEN T. ZECH, *The Human, Economic, Social, and Political Costs of COVID-19*, *in* RECOVERING CIVILITY DURING COVID-19 1 (2021) (taking a wide perspective in looking at the social and economic costs surrounding the response to the COVID-19 pandemic).

326. *Trail Smelter I*, 3 R.I.A.A. at 1910 (covering Article XIII stating that while each State is responsible to the preparation costs of its case before the Tribunal, all other expenses are to be shared).

zation of cost, not to mention an immense injustice.[327] The effort also should be shaped by an equitable commitment to finding a "solution just to all parties."[328] This would discount liability on the part of China out of respect for the universal and natural dynamics involved in a pandemic. Even if China has been a frequent source of viral outbreaks in the last decades, an unavoidable element of the case is that, in fact, it could (and may) happen to any state.[329] An equitable approach also would take account of the necessity that China's economy continues to "operate" in the same way that the arbitrators accepted that the Trail Smelter would continue to function. The compensation awarded should not be crippling. And, in any case, international law awards categorically eschew the notion of punitive or exemplary damages.[330] Finally, the proportional spirit of the exercise should account for the egregious examples of mismanagement and ill-advised policy that too-often and tragically exacerbated the direct and indirect costs of the crisis in some states.[331]

IV. Conclusion

The Transboundary Harm Principle provides a customary international law norm that would permit states to seek relief for the Chinese government's potential international law re-

327. *Id.* at 1920 (citing Story Parch. Co. v. Paterson Parch. Paper Co., 272 U.S. 555, 563 (1931)).

328. *Id.* at 1908 (from Article IV of the 1935 Special Convention creating the tribunal to resolve the Trail Smelter dispute).

329. *See* David Heymann, Emma Ross, & Jon Wallace, *The Next Pandemic – When Could It Be?,* Chatham House (Feb. 23, 2022), https://www.chathamhouse.org/2022/02/next-pandemic-when-could-it-be/ [https://perma.cc/8QC4-XGZA] (nothing that while Southern China seems to have a trend for outbreak, especially of the influenza variety, the next "pandemic could begin anywhere where there is close interaction of people and either domesticated or wild animals.").

330. *See generally* Nina H. B. Jørgensen, Punitive Damages in International Law (2000); Nina H. B. Jørgensen, *A Reappraisal of Punitive Damages in International Law*, 68 British Y.B. Int'l L. 247 (1997); Clyde Eagleton, *Measure of Damages in International Law*, 39 Yale L. J. 52 (1929) (all noting the hesitancy to implement punitive damage in international law decisions).

331. *See* German Lopez, *America's Pandemic Failures*, N.Y. Times (Aug. 18, 2022), https://www.nytimes.com/2022/08/18/briefing/monkeypox-cdc-walensky-covid.html/ [https://perma.cc/8LR8-YCHE] (exploring the various failures of the U.S. and state governments' response to COVID on an institutional and political level).

sponsibility resulting from the acts and omissions that led to the global COVID-19 pandemic. The *Trail Smelter Arbitration* defined that customary international law rule, holding that no state may use or permit the use of its territory in such a manner as to cause significant injury in the territory of another state. Significantly, the *Trail Smelter Arbitration's* application of that rule to the dispute between the U.S. and Canada involved a cautious and proportional approach that serves as an insightful illustration for the application of the Principle to the pandemic. The Transboundary Harm Principle establishes a fair and equitable regime for resolving a "clash of sovereignties."

This article's proposal that the Transboundary Harm Principle applies to the pandemic is in no way born out of animus towards China; rather, it seeks to advance a deep commitment to the global order, including the public international law regime that makes it possible. State sovereignty is the heart of that global order. The *Trail Smelter Arbitration* identified a norm for reinforcing state sovereignty in our globalized era. Wisely, the tribunal applied that norm in a cautious and proportional manner that largely reinforced the *status quo* concern for the vast scope of states' territorial sovereignty. The international order and public international law need the lessons of the *Trail Smelter Arbitration* now more than ever before. The pandemic originated in China, and there are profound policy and legal reasons for considering whether the Chinese government's acts and omissions were the cause of the pandemic's immense transboundary harm. The Transboundary Harm Principle establishes a cautious and proportional substantive rule for determining state responsibility in this case, and the *Trail Smelter Arbitration* still provides instructive insight into the application of that rule.

Ultimately, the Transboundary Harm Principle may provide some level of justice in response to the gravest and deadliest global crisis of our age, through an international law mechanism that also reinforces the centrality of state sovereignty. The reaffirmation and reinforcement of justice, law, and sovereignty in the framework of international law would be a welcome outcome of the devastating and deadly COVID-19 pandemic.