UNIVERSITY OF CALIFORNIA

Santa Barbara

The Global Environmental Moment:

Sovereignty and American Science on Spaceship Earth, 1945-1974

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in History

by

Roger Eardley-Pryor

Committee in charge:

Professor W. Patrick McCray, Chair

Associate Professor Peter S. Alagona

Associate Professor Salim Yaqub

June 2014

The dissertation of Roger Eardley-Pryor is approved.

_____
Salim Yaqub

_____
Peter S. Alagona

_____
W. Patrick McCray, Committee Chair

March 2014

The Global Environmental Moment:

Sovereignty and American Science on Spaceship Earth, 1945-1974

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VITA OF ROGER EARDLEY-PRYOR

March 2014

EDUCATION

2014	University of California, Santa Barbara, Ph.D. in History
2008	University of California, Santa Barbara, M.A. in History
2000	Miami University, B.Phil. in Interdisciplinary Studies, *magna cum laude*

AWARDS AND HONORS

2010-2013	National Science Foundation, Graduate Research Fellow Center for Nanotechnology in Society-UCSB
2012	UCSB Academic Senate Travel Grant
2011	UCSB Lawrence Badash Prize, Outstanding Work in History of Science and Technology
	UCSB Dick Cook Award, Outstanding Achievements in Research, Teaching, and Service
	Research Grant, Rockefeller Archive Center, Sleepy Hollow, NY
2010	Graduate Fellow, UC Washington Center (UCDC), Washington, DC
2009	UCSB John Coleman Award, Outstanding Work in History of U.S. Foreign Relations
2008	Graduate Fellow, UCSB Center for Cold War Studies
	Workshop Grant, George Washington University, Summer Institute on Conducting Archival Research (SICAR)

TEACHING EXPERIENCE

Department of History, Washington State University-Vancouver - Instructor

2013 Global American Century: U.S. & the World, 1941-Present

Roots of Contemporary Issues [interdisciplinary freshman seminar]

Department of History, Portland State University - Instructor

2013 Global Environment and History

Office of Instruction Development, University of California, Santa Barbara – Teaching Consultant

2010 Instructional Consultant to UCSB Teaching Assistants, all departments

Department of History, University of California, Santa Barbara – Teaching Assistant

2009 Head History Teaching Assistant, TA-Training Program Leader

2008-2011 The American People, WWI-Present – 2 quarters
The American People, 1840-1920 – 1 quarter
The American People, 1492-1820 – 2 quarters
World History, 1000-1700 C.E. – 1 quarter

Law and Society Program, University of California, Santa Barbara – Teaching Assistant

2005-2007 U.S. Race & Law – 1 quarter
Law and Politics – 2 quarters
Law and Society – 1 quarter

PUBLICATIONS

2014 "Better to Cry than Die? The Paradoxes of Tear Gas in the Vietnam Era." In *Toxic Airs: Body, Place, Planet in Historical Perspective*, edited by James Rodger Fleming and Ann Johnson (Pittsburgh, PA: University of Pittsburgh Press, 2014).

2013 Review of *Blue Sky Metropolis: The Aerospace Century in Southern California*, edited by Peter J. Westwick. *H-California, H-Net Reviews*. July 2013. https://www.h-net.org/reviews/showrev.php?id=38349

2012 "Lake Victoria." *Berkshire Encyclopedia of Sustainability, Vol. 9; Afro-Eurasia: Assessing Sustainability* (Great Barrington, MA: Berkshire Publishing, 2012).

Review of *Environmental Histories of the Cold War*, edited by J. R. McNeill and Corinna R. Unger. *Journal of World History* 23:1 (March 2012), pp. 231-235.

2011 Review of *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming,* by Paul N. Edwards. *AEEE Annals of the History of Computing* 33:1 (Jan-March 2011), pp. 83-85.

CONFERENCE PRESENTATIONS

2013 "Limits and Legacies: The Limited Test Ban Treaty and Global Environmentalism." History of Science Society (HSS) annual conference, in panel, "The Fifty-Year Anniversary of the Limited Test Ban Treaty: Origins and Legacies." Boston, MA. 22 November 2013.

"Regulating Innovation via Analogy: The Case of Nanotechnology." Co-written with W. Patrick McCray. Workshop on Pressing Issues: The History of Technology Meets Public Policy. Colby College, ME. 7 October 2013.

"How Ecotopian Visions of Nanotechnology Influenced U.S. Environmental Health and Safety." Poster Presentation. American Society for Environmental History (ASEH) annual conference. Toronto, Canada. 6 April 2013.

"A Green-Ringed Circus: Science, Counter-Culture, and Chaos at the 1972 Stockholm Conferences." Columbia History of Science Group (CHSG) annual conference. Friday Harbor Laboratories, San Juan Island, WA. 9 March 2013.

2012 "Prophets of Doom on a Global Stage: Commoner, Ehrlich, and the Politics of Climate Catastrophe." History of Science Society (HSS) annual conference. San Diego, CA. 18 November 2012.

"Reclaiming Environment for Development: Brazil and the Roots of Sustainable Development at the 1972 UN Stockholm Conference." International Conference on Environmental Protection in the Global Twentieth Century. Freie Universität Berlin, Germany. 26 October 2012.

"Planet Nano-topia: Nanotechnology and Nature in a Techno-Utopia." Society for the Study of Nanoscience and Emerging Technologies (S.NET) annual conference. University of Twente, Enschede, The Netherlands. 22 October 2012. (Panel Co-Organizer.)

"Take a Little Risk? Historical Analogies and the Regulation of Nanotechnology." Co-written with W. Patrick McCray. 2012 Business History Conference. Philadelphia, PA. 30 March 2012.

"Commoner and Ehrlich in Stockholm and the Contemporary Crisis of Climate Change: Conflicts of Science and Sovereignty in Global Environmental Diplomacy." Santa Barbara Global Studies Conference: "CRISIS." University of California, Santa Barbara. Santa Barbara, CA. 24 February 2012.

"Systems, Scientists, and Sovereignty: Dai Dong and the Limits of Transnational Environmentalism." American Historical Association (AHA) annual meeting; panel sponsored by the American Society for Environmental History (ASEH). Chicago, IL. 7 January 2012.

2011 "Regulatory Analogues? Environmental History and Nanotechnology's Potential Future." Society for the Study of Nanoscience and Emerging Technologies (S.NET) annual conference. Tempe, AZ. 9 November 2011.

"Leveraging Science Against Sovereignty: Dai Dong's Menton Statement and Third World Conflict." History of Science Society (HSS) annual conference, in panel, "Establishing Networks of Nature's Experts: Environmental Science and State Power," sponsored by the HSS Earth and Environment Forum. Cleveland, OH. 6 November 2011. (Panel Co-Organizer).

"Looking Backward to Look Forward: Historical Examples for Nanotechnology's Environmental Future." Public History of Science and Technology Conference. University of South Carolina. Columbia, SC. 14 September 2011.

"Crying Over Chemical Climates: The Paradoxes of Tear Gas in the Vietnam Era and Today." 2011 Gordon Cain Conference – Chemical

Weather and Chemical Climate: Body, Place, Planet in Historical Perspective. Chemical Heritage Foundation. Philadelphia, PA. 1 April 2011.

2009 "'The Fruits of Science for Death and Destruction': AAAS Scientists' Environmental Activism against Operation Ranch Hand in Vietnam." International Graduate Student Conference on the Cold War annual conference. London School of Economics and Political Science. London, UK. April 2009.

INVITED LECTURES

2013 "Zombie Pandemic! Disease, Race, and Consumption of a Pop-Culture Phenomenon." Invited Lecture. Global Pandemics: Roots of Contemporary Issues course. Washington State University-Vancouver. Vancouver, WA. 26 September 2013.

"Environmental History and Nanotechnology." Invited Lecture. Environmental Histories of Science and Technology course. Lewis and Clarke College. Portland, OR. 11 April 2013.

"Considering Nanotechnology: Large Societal Impacts of the Very Small." Invited Lecture. The Institute of World Culture. Santa Barbara, California. 16 March 2013.

2012 "Ethics and Emerging Technologies: Bio-, Nano-, and Geo-Engineering." Invited lecture. Engineering and Ethics course. University of California, Santa Barbara. Santa Barbara, CA. 23 May 2012.

"Archival Research with Digital Tools." Invited lecture. Environmental History Research Seminar. University of California, Santa Barbara. Santa Barbara, CA. 9 April 2012.

2011 "The Global Environmental Moment." Invited panelist. Philanthropy and the Environment Workshop. Rockefeller Archive Center. Sleepy Hollow, NY. 19 May 2011.

PROFESSIONAL SERVICE

2013 Associate Editor, *Journal of Environment and Development*

NanoDays Museum Volunteer, NISE Network, Santa Barbara Museum of Natural History

2012	Editorial Reviewer, *Berkshire Encyclopedia of Sustainability, Vol. 10: The Future of Sustainability* (Great Barrington, MA: Berkshire Publishing, 2012).
	Fund Raising Chair, UCSB History Graduate Student Association
2011	NanoDays Museum Volunteer, NISE Network, Santa Barbara Museum of Natural History
2008-2009	Graduate Studies Committee, Graduate Student Representative, UCSB Department of History
2008	Graduate Research Assistant, Professor W. Patrick McCray
2007-2008	Graduate Coordinator and Administrative Assistant UCSB Center for Cold War Studies and International History Conference Organizer, (4-5 April 2008), International Graduate Student Conference on the Cold War (at UCSB in conjunction with the London School of Economics & George Washington University)
2006-2008	President, UCSB History Graduate Student Association
2006	Graduate Research Assistant, Professor Lisa Jacobson
2005-2006	Secretary, UCSB History Graduate Student Association

ABSTRACT

The Global Environmental Moment:

Sovereignty and American Science on Spaceship Earth, 1945-1974

by

Roger Eardley-Pryor

This dissertation argues that the still-existent political contours of international engagement on global environmental issues were forged in the late 1960s and early 1970s, in what I call the global environmental moment, during planning for and in the actions taken surrounding the first intergovernmental conference on the world environment: the United Nations Conference on the Human Environment (UNCHE), held in Stockholm Sweden in June 1972. Throughout the prior years of planning for the UNCHE, relatively less developed nations of the global South, led by Brazil, demanded that all environmental efforts must support—not limit—endeavors toward economic development, and along with other members of the Unite Nations, refused to relinquish their national sovereignty for the sake of global environmental protection. Ultimately, the UNCHE produced a Declaration, an Action Plan, and a new United Nations Environment Program (UNEP) to coordinate environmental planning within the UN; yet these outward successes institutionalized non-binding, disjointed, and underfunded efforts that split the global North and

South over the means for attaining global environmental protection. With the UN conference refusing to alter the status quo of geopolitical organization and impotent against stemming the environmental impact of economic development, large numbers of non-governmental organizations, politically active scientists, and environmental advocates of all stripes also descended on Stockholm to voice their own opinions on the causes and solutions to ongoing environmental degradation. Yet, the alternative conferences in Stockholm where these outliers met also fractured in political conflicts between advocates for the global South and those promoting environmental remedies popular in the global North. Collectively, the collapse of the global environmental moment amid these political and ideological differences created the historical ruts in which debate on global environmental issues have continued to tread ever since.

TABLE OF CONTENTS

INTRODUCTION.

There is nothing more difficult to carry out,
nor more doubtful of success,
nor more dangerous to handle,
than to initiate a new order of things.
— Niccolo Machiavelli, *The Prince*, 1505.

Anyone who proposes to cure the environmental crisis undertakes thereby to change the course of history.
— Barry Commoner, *The Closing Circle*, 1971.

In the summer of 1972, the city of Stockholm, Sweden became host to a global environmental circus. This circus transpired inside grand government meeting halls, instead of under colorful tents, from June 5 to 16, 1972. It featured some 1,200 delegates from the governments of 114 nations—including most of the world's heavily industrialized nations and its less-developed countries (LDCs)—over a dozen intergovernmental agencies, nearly 500 officially recognized environmental non-governmental organizations (NGOs), untold numbers of non-official environmental activists, popular environmental scientists, two bus-loads of counterculture commune dwellers, and well over a thousand journalists to report for the world Stockholm's performances. The purpose of this gathering was a collection of conferences organized to address the environmental crisis threatening survival on what many called Spaceship Earth, and to determine appropriate actions toward correcting global environmental problems. This dissertation examines the rise of a planetary framing for environmental concern about Spaceship Earth, and the opposing political reactions by actors in the industrialized North and the

underdeveloped South as they prepared for and engaged in Stockholm's environmental circus.

In Stockholm, the United Nations Conference on the Human Environment (UNCHE) provided the primary anchor around which a carnival of other environmental colloquiums arose. The so-called alternative conferences included the Dai Dong Independent Conference for environmental experts and scientists, and the semi-official Environment Forum for NGOs and environmental activists to address their respective positions on the global crisis. As a whole, Stockholm's environmental circus included main events and sideshows; it featured some predictable performances but also a few surprises; and it saw a mix of conflict and collaboration. But, as this dissertation argues, the events leading up to Stockholm and those that occurred there all created a lasting legacy that carved the contours of global environmental politics then and since.

Several reports about Stockholm's cotillion of environmental conferences characterized the scene as akin to a festival. Britain's *New Statesmen* magazine, New York's *Village Voice*, and *Time* magazine all referred to the collective events as "Woodstockholm." British reporter Stanley Johnson named the non-UN gatherings "rival sideshows," and he later expanded his inclusion of the official UNCHE meeting as embodying a "Stockholm Funfair." Canadian writer Wade Rowland described the participants in Stockholm's environmental events as formal foreign ministers and international diplomats in pin-striped business suits, who were surrounded by a "colorful collection of Woodstock graduates, former Merry Pranksters and other assorted acid-heads, eco-freaks, save-the-whalers, doomsday

mystics, poets, and hangers-ons." Peter Stone, the senior information advisor to Maurice F. Strong, the Secretary-General of the UNCHE, described Stockholm as having "many of the attributes of a theatrical festival," including elegant sets, reams of script, heroes, villains, and, at least among some hippie protestors, "even a bit of off-stage nudity." The *Washington Post* commented, "if the conference should indeed leave a historic imprint, it will be largely as a happening."[1] In terms of environmental politics, however, Stockholm's historical imprint remains much deeper and larger than previously appreciated.

Still, after more than two years of serious preparations for Stockholm, and after nearly two weeks of environmental meetings there, Britain's Stanley Johnson considered the alternative conferences as "something of a shambles." Regarding the entire affair, including the UN meeting, he proclaimed to have "witnessed a gigantic ritual, a three-ring circus played out in the three conference sites." Peter Stone similarly outlined Stockholm's circus-like events as having taken place in a series of outer and inner rings. If anyone should have had a handle on the environmental events in Stockholm, it seems the UNCHE's senior information advisor Peter Stone should. Yet even Stone concluded, "I have not yet met anyone who did not express a feeling of bewilderment at trying to find out what actually did go on at Stockholm.

[1] Stanley Johnson, "Stockholm 1972," *New Statesman*, June 2, 1972, 742-743; Ross Gelbspan and David Gurin, "Woodstockholm '72: The Subject Is Survival," *Village Voice*, May 11, 1972; "Woodstockholm," *Time*, June 19 1972, 55; Stanley Johnson, "Stockholm Funfair," *New Statesman*, June 9, 1972; Wade Rowland, *The Plot to Save the World: The Life and Times of the Stockholm Conference on the Human Environment* (Toronto: Clarke, Irwin, & Co. Ltd., 1973), 1; Peter Stone, *Did We Save the Earth at Stockholm?* (London: Earth Island Ltd., 1973),17; Claire Sterling, "UN Environment Conference: A Happening," *Washington Post*, June 17, 1972, A13.

Everybody had a feeling that they had missed something vital."[2] Indeed, something vital has been missed about the events in Stockholm and those leading up to it. The reference to Stockholm as a multi-ringed circus offers a hint as to why something vital about those environmental engagements was missed then, and has been overlooked since.

A Whole-Systems View on Stockholm's Environmental Circus

In a collection of essays titled *Pandora's Hope*, the French philosopher of science Bruno Latour suggested the image of a multi-ringed rosace to illustrate what he construed as the circulatory system for producing accurate knowledge in a particular realm. Latour proposed that the various rings of a given domain embodied at least five components, including the mobilization of a research field, typically a scientific discipline; the contributions of a transnational community of experts who could be scientists, intellectuals, or policymakers sometimes identified as an "epistemic community"; the establishment of boundary-crossing affinities formed outside the expert community in order to acquire influence; and, finally, the inclusion of public participation. A center ring in Latour's rosace established various nodes and links to the other rings and held the knowledge producing system cohesively. In order to understand a particular system of knowledge production, Latour encouraged historians, social scientists, and natural scientists alike to remain aware not only of the core ring identifying the specific realm, regime, or domain of knowledge produced, but to include awareness of the various interconnections

[2] Stanley Johnson, "Stockholm Roundup," *New Statesman*, June 16, 1972; Peter Stone, *Did We*

between the rings as well as perceive the ensemble as a whole.[3] In short, they must account for the whole system of interactions in order to comprehend the import of what knowledge was produced. One must envisage the whole system, not just one part.

We can apply a similar approach to the multi-ringed environmental circus in Stockholm in the summer of 1972, and the various dynamics that crested and culminated there. Like Latour's rosace, the circumstances leading up to Stockholm and those that transpired there included the mobilization of environmental science, the efforts of boundary working knowledge brokers who aimed to gain influence by linking various communities or by co-opting their authority, as well as participation by diverse publics and governments from around the world. In order to understand Stockholm's importance for global and international environmental politics, and to comprehend the knowledge that Stockholm's green-ringed circus produced collectively, we must see it through a wide historical lens that accounts for its inspiration, the years of preparation for its events, and the actual action that occurred in Stockholm at the historical dawn of global environmental politics. In my historical analysis of early global environmental politics, I use the world global as shorthand

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Save the Earth at Stockholm? (London: Earth Island Ltd., 1973), 132-133, 136-137.

[3] Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), 103. For the concept of epistemic communities and their role in forming international policy, specifically environmental policies, see Peter M. Haas, "Introduction: Epistemic Communities and International Policy Coordination," *International Organization* 46:1 (1992), 1-35; Peter M. Haas, "Obtaining International Environmental Protection through Epistemic Communities," *Millennium Journal of International Studies* 19:3 (1990), 347-363; Peter M. Haas, *Saving the Mediterranean: The Politics of International Environmental Coordination* (New York: Columbia University Press, 1990). For the application of Latour's rosace to the production of knowledge surrounding climate change, see Amy Dahan Dalmedico and Hélène Guillemot, "Climate Change: Scientific Dynamics, Expertise, and Geopolitical Challenges" in *Global Science and*

for phenomena that move toward the planetary, and like Latour's rosace, requires a worldwide frame of reference.[4] As Latour might say, we cannot understand the *process* of knowledge production leading up to the Stockholm conferences—nor the actual knowledge *produced* there—without comprehending the whole system and the interconnections between its rings.

This dissertation offers an in-depth history of the processes that led up to the environmental circus in Stockholm, the interconnecting events and conflicts that transpired at Stockholm in three different conferences there, and the political legacies that all of these developments produced for international environmental politics. The audience for this dissertation includes environmental historians interested in the dawn of international and global environmental politics in the post-World War II period.[5] It includes historians of science interested in the behavior of scientists as political actors, in this case both environmental scientists and social scientists.[6] And it includes diplomatic historians who have begun integrating the

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National Sovereignty: Studies in Historical Sociology of Science, edited by Grégoire Mallard, Catherine Paradeise, and Ashveen Peerbaye (New York: Routledge, 2009), 213-214.

[4] I use the term "international" when dealing explicitly with issues between sovereign nations, but I prefer the term "global" when emphasizing the agency of actors and ideas beyond inter-state relations. For multiple and sometimes contradictory interpretations on the meaning and content of global environmental history, see "What Is Global Environmental History? Conversation with Piero Bevilacqua, Guillermo Castro, Ranjan Chakrabarti, Kobus du Pisani, John R. McNeill, Donald Worster," edited by Gabriella Coronia, in *Global Environment* 2 (2008), 228-249; J. Donald Hughes, "Global Dimensions of Environmental History," *The Pacific Historical Review* 70:1 (2001), 91-101.

[5] Though they include only brief references to events in Stockholm, for environmental histories that address post-World War II international politics, see J.R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (New York, W.W. Norton, 2000), especially 325-356; J. Brooks Flippen, "Richard Nixon, Russell Train, and the Birth of Modern American Environmental Diplomacy," *Diplomatic History* 32:4 (September 2008), 613-638; Thomas Robertson, *The Malthusian Moment: Global Population and the Birth of American Environmentalism* (New Brunswick, NJ: Rutgers University Press, 2012).

[6] For studies incorporating the role of scientists as experts in international politics, although mostly limited in their analysis on environmental and social scientists, see Zuoyue Wang, *In Sputnik's Shadow: The President's Science Advisory Committee and Cold War America* (New Brunswick, NJ: Rutgers University Press, 2008), especially 199-218; John Krige, *American Hegemony and the*

environment and diplomacy in their scholarship but remain slow to recognize the role that environmental issues played in the shift of the world's dominant political axis from East-West to its current North-South alignment.[7]

This dissertation argues that the still-existent political contours of international engagement on global environmental issues were forged in the late 1960s and early 1970s, in what I call the global environmental moment, during planning for and in the actions taken surrounding the first intergovernmental conference on the world environment: the UNCHE, held in Stockholm Sweden in June 1972. Throughout the prior years of planning for the UNCHE, relatively less developed nations of the global South, led by Brazil, demanded that all environmental efforts must support (not limit) endeavors toward economic development, and along with other nations in the UN, refused to compromise their national sovereignty for the sake of global environmental protection. Ultimately, the UNCHE produced a Declaration, an Action Plan, and a new United Nations Environment Program (UNEP) to coordinate environmental planning within the UN. Yet these outward successes institutionalized non-binding, disjointed, and

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Postwar Reconstruction of Science in Europe (Cambridge, MA: MIT Press, 2006); Allan A. Needell, *Science, Cold War and the American State: Lloyd V. Berkner and the Balance of Professional Ideals* (Amsterdam: Harwood Academic Press, 2000).

[7] For analysis and encouragement on integrating these two fields, see Kurk Dorsey, "Dealing with the Dinosaur (and Its Swamps): Putting the Environment in Diplomatic History," *Diplomatic History* 29:4 (2005), 573-587; Mark Lytle, "An Environmental Approach to American Diplomatic History," *Diplomatic History* 20 (Spring 1996): 279–300. The best examples of environmental diplomatic histories include Richard P. Tucker, *Insatiable Appetite: The United States and the Ecological Degradation of the Tropical World* (Berkeley: University of California Press, 2000); Jacob Darwin Hamblin, *Poison in the Well: Radioactive Waste in the Oceans at the Dawn of the Nuclear Age* (New Brunswick, NJ: Rutgers University Press, 2008); J.R. McNeill and Corinna R. Unger, eds., *Environmental Histories of the Cold War* (Washington, D.C.: German Historical Institute; New York: Cambridge University Press, 2010); David Zierler, *The Invention of Ecocide: Agent Orange, Vietnam, and the Scientists Who Changed the Way We Think about the Environment* (Athens, GA: University

underfunded efforts that split the global North and South over the means of attaining global environmental protection. With the UN conference refusing to alter the status quo of geopolitical organization and impotent against stemming the environmental impact of economic development, large numbers of non-governmental organizations, politically active scientists, and environmental advocates of all stripes also descended on Stockholm to voice their own opinions on the causes and solutions to ongoing environmental degradation. Yet, even the alternative conferences in Stockholm where these outliers met also fractured in political conflicts between advocates for the global South and those promoting environmental remedies popular in the global North. Collectively, the collapse of the global environmental moment amid these political and ideological disputes created the historical ruts in which debate on global environmental issues have continued to tread ever since.

Historiographic Intervention

Perhaps because of the confusing circus-like atmosphere of Stockholm or because of the topic's relative newness, historians have yet to give these first conferences on the global environment serious and sustained analysis. When environmental events from Stockholm do appear in historical monographs, it typically features cursory mention of only the UNCHE (rarely the alterative conferences) and the UNCHE's supposed accomplishments—what I identify as merely nominal acclimation on the Declaration on the Human Environment, an unavailing Action Plan with its 109 vague recommendations, and the ineffectual

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of Georgia Press, 2011); Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic*

UNEP.[8] I know of no historical monograph like this dissertation, which examines in depth the rise of global environmental concern, the political conflicts that arose from it, and the various events that occurred in Stockholm as a result, both within the UN conference and beyond it.[9]

Rather than historians, political scientists and other scholars interested in international environmental governance were the first to analyze Stockholm-related developments, usually in the context of more recent events. Yet here, too, much political science scholarship lacks both detailed analysis and historical perspective, especially on the events preceding the Stockholm conferences and forums, but also on the conferences and forum themselves. When discussions of Stockholm do appear in political science and related scholarship on global environmental politics, those works often celebrate Stockholm uncritically as a resounding success, or they briefly reference it merely as a precursor to better-known events nearly two decades after Stockholm. For example, without comprehensive analysis of what actually transpired in the late 1960s and early 1970s regarding Stockholm and the political stagnation it

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Environmentalism (Oxford: Oxford University Press, 2013).

[8] Exceptions among historical scholarship that do reference the Environment Forum, only one of the alternative conferences in Stockholm, typically include little more than a paragraph or two. See Frank Zelko, *Make It A Greenpeace! The Rise of Countercultural Environmentalism* (Oxford: Oxford University Press, 2013), 135; David Zierler, *The Invention of Ecocide: Agent Orange, Vietnam, and the Scientists Who Changed the Way We Think about the Environment* (Athens, GA: University of Georgia Press, 2011) 165-166; Michael Egan, *Barry Commoner and the Science of Survival: The Remaking of American Environmentalism* (Cambridge, MA: MIT Press, 2007), 134; J. Brooks Flippen, *Nixon and the Environment* (Albuquerque: University of New Mexico Press, 2000), 173.

[9] Two books about events in Stockholm, a journalistic account and a memoir-like interpretation, appeared without much historical perspective a year after Stockholm. See Wade Rowland, *The Plot to Save the World: The Life and Times of the Stockholm Conference on the Human Environment* (Toronto: Clarke, Irwin, & Co. Ltd., 1973); Peter Stone, *Did We Save the Earth at Stockholm?* (London: Earth Island Ltd., 1973). And although it was written by a political scientist and not a historian, the best general overview of events leading up to Stockholm in 1972 and especially the events up through the early 1990s remains John McCormick, *The Global Environmental Movement* (West Sussex, UK: John Wiley & Sons, 1995), especially Chapter 5.

spawned for international environmental politics, political scientists Caroline Thomas and Marvin S. Soroos promoted the UN's achievements in Stockholm as "a milestone" in international relations and a "major landmark" for institution building, yet without suitable analyses, they move their narratives to events in the 1980s and 1990s.[10] Other scholars seem to overlook the importance of events in early 1970s entirely. For instance, Paul Wapner wrote that, "throughout the 1980s … it became increasingly clear that environmental groups could not save wildlife, biologically rich areas and stunning landscapes in the South unless they also worked to help citizens in the South prosper economically and enjoy the fruits of socioeconomic development." He continued to note with regard to global environmental affairs that "during the 1980s" the global South "recognized how many international environmental actions threatened to stymie its own development plans."[11] Yet, as this dissertation shows, both of these developments clearly occurred first in the early 1970s during the preparatory process for Stockholm.

Similarly, Sheila Jasanoff wrote, "it was not until the later 1980s that a global conception of environmental protection rooted itself in Western consciousness," which she claims occurred alongside the supposedly new notion of sustainability.[12]

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[10] Caroline Thomas, *The Environment in International Relations* (London: Royal Institute of International Affairs, 1992), 21; Marvin S. Soroos, "Global Institutions and the Environment: An Evolutionary Perspective," in *The Global Environment: Institutions, Law and Policy*, edited by Norman J. Vig and Regina S. Axelrod (Washingon, DC: Congressional Quarterly Press, 1999), 27-51, here 28.

[11] Paul Wapner, "After Nature: Environmental Politics in a Postmodern Age," in *Handbook of Global Environmental Politics*, edited by Peter Dauvergne (Cheltenham, UK: Edward Elgar, 2005), 471-485, here 472.

[12] Sheila Jasanoff, "Image and Imagination: The Formation of Global Environmental Consciousness," in *Changing the Atmosphere: Expert Knowledge and Environmental Governance*, edited by Clark A. Miller and Paul N. Edwards (Cambridge, MA: MIT Press, 2001), 309-337, here 324.

As this dissertation explains, a global conception of environmental protection engrained itself far earlier, especially with concerns in the late 1950s about atomic fallout, which developed throughout the 1960s in an environmental revolution that ultimately climaxed in Stockholm.[13] Admittedly, the 1980s did witness the popularization of the term sustainable development, especially with the publication in 1987 of *Our Common Future* by the World Commission on Environment and Development (WCED). Otherwise known as the Brundtland Report—named after the chair of the WCED, Norway's former prime minister Gro Harlem Brundtland—this influential UN-sponsored document famously defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs," thus seeking a balance between human needs and environmental limitations.[14] This concept then played a central role in the UN Conference on Environment and Development in 1992, commonly known as the Rio Earth Summit. Yet, again, as this dissertation shows, the roots of the concept of sustainable development extend back at least twenty years to the early 1970s, when LDCs from the global South, led by Brazil, made development the necessary central component in any unified efforts in the UN toward global environmental management and international environmental political progress.

[13] For the deeper intellectual roots on environmental consciousness, if not global prior to World War II than certainly at national and regional scales, see Donald Worster, *Nature's Economy: A History of Ecological Ideas,* Second Edition (Cambridge, UK: Cambridge University Press, 1994); Roderick Frazier Nash, *Wilderness and the American Mind*, Fourth Edition (New Haven, CT: Yale University Press, 2001).

[14] World Commission on Environment and Development (WCED), *Our Common Future* (Oxford: Oxford University Press, 1987), 43.

Occasionally, when events from the global environmental moment of the early 1970s provide merely a pretext for the 1992 Rio Earth Summit and later events, representations of Stockholm can appear demonstrably false. For instance, Robert G. Fleagle wrote that "the Stockholm conference could be characterized as the environmental scientific community of developed countries talking to government officials about measures to reduce global environmental degradation, with representatives of developing countries in a largely observing role." Fleagle continued to claim that the UN's 1992 Rio conference finally provided the initial occasion where "the mutual and conflicting interests of developed and developing countries came together and were addressed frontally."[15] In fact, the scientific community in Stockholm remained relegated to the under-examined peripheral conferences, while political representatives from LDCs dominated both the planning for and practices of the UNCHE—the actual site where the interests of industrial nations and LDCs initially met under the 1970s rubric of "Development and Environment." This dissertation reveals how both of Fleagle's claims totally ignore the global political dynamics and developments at the dawn of global environmental politics surrounding Stockholm.

Despite limited historical understanding of details on the development and premature paralysis of global environmental politics in the early 1970s, political scientists' analyses on its later machinations typically fall into one of three general categories. Those categories generally include studies on the importance of states and institutions to regimes for global environmental governance, studies focused on

[15] Robert G. Fleagle, *Global Environmental Change: Interactions of Science, Policy, and Politics*

the environmental issues of political economy, and studies concentrating on the roles of civil society and science.[16] This dissertation provides a historical focus on the origins of all three of these themes, with recognition of state behavior in helping shape the initial and still-existent contours of global environmental politics, its grounding in the dynamics of political economy between North and South, and the early efforts of environmental scientists and non-state organizations to provide alternative solutions to global environmental problems. In his literature review of global environmental politics back in 1998, political scientist Michael Zürn noted correctly that, "world politics is much more than intergovernmental politics and includes a wider range of actors than states, and world politics is not only about power and material interests but is also about nonmaterial interests, ideas, knowledge, and discourses."[17] Notwithstanding that reality, many of the existing studies on global environmental politics lack an appreciation of the deeper history of its collective dynamics.

As such, this dissertation offers what some scholars identify as historical political ecology. According to a long-standing definition by geographers Harold Brookfield and Piers Blaikie, political ecology aims to unify "the concerns of ecology and a broadly defined political economy. Together this encompasses a constantly shifting dialectic between society and land-based resources, and also

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in the United States (Westport, CT: Praeger, 1994), 192.

[16] Peter Dauvergne, "Research in Global Environmental Politics: History and Trends," in *Handbook of Global Environmental Politics*, edited by Peter Dauvergne (Cheltenham, UK: Edward Elgar, 2005), 8-32; Ronald B. Mitchell, "International Environment," in *Handbook of International Relations*, edited by Thomas Risse, Beth Simmons, and Walter Carlnaes (London: Sage Publications, 2002), 500-516.

[17] Michael Zürn, "The Rise of International Politics: A Review of Current Research," *World Politics* 50:4 (July 1998), 617-649, here 618.

within classes and groups within society itself." When adding archive-based historical analysis to such research, however, Karl Offen expanded those aims by identifying *historical* political ecology as an "interpretation of society-nature relations in the past … how and why those relations have changed (or not changed) over time and space, and the significance of those interpretations for improving social justice and nature conservation today." Diana K. Davis further noted that most studies of historical political ecology, like this dissertation, "deliberately relate their research to contemporary situations." As pioneering environmental historian Donald Worster has said, "we will not get out of the global environmental crisis the way we got into it. But if we don't understand how we got into it, we will never find a way out. That is why we need historians."[18] My hope is that this dissertation offers some slight aid in thinking our way out of our current trajectory toward continued global environmental problems by showing how contemporary political deadlock on those issues appeared far earlier than previously recognized by most and within particular historical contexts. Given new contemporary contexts, perhaps this history will help other scholars and environmental actors move beyond the politics of over forty years ago.

[18] Harold Brookfield and Piers Blaikie, *Land Degradation and Society* (London: Methuen, 1987), 17; Karl Offen, "Historical Political Ecology: An Introduction," *Historical Geography* 32 (2004), 19-42, here 21; Diana K. Davis, "Historical Political Ecology: On the Importance of Looking Back to Move Forward," *Geoforum* 40 (2009), 285-286; Donald Worster in "What Is Global Environmental History? Conversation with Piero Bevilacqua, Guillermo Castro, Ranjan Chakrabarti, Kobus du Pisani, John R. McNeill, Donald Worster," edited by Gabriella Coronia, in *Global Environment* 2 (2008), 228-249, here 245.

Structure and Summary of the Dissertation

The structure of this dissertation moves through three main sections. Its initial section includes two chapters that explain the conceptual and scientific impetus behind the global environmental moment in the development of perspectives that envisioned ecological, social, and political systems as interconnected at worldwide scales. The popular metaphor of a fragile and imperiled Spaceship Earth signified this systems perspective, which coincided in the late 1950s and throughout the 1960s with new realizations about ways that modern sciences and technologies created environmental threats to those global systems. The next main section focuses on social and political reactions to newly realized environmental hazards, first by nations of the industrialized global North, followed by opposite political reactions from relatively less developed countries of the global South. This section addresses those political dynamics during the years of planning before the UN's first intergovernmental global environmental conference scheduled for Stockholm in 1972. It moves back and forth between concerns in the global North about the negative environmental impact of economic growth, and demands from the global South for intensifying economic development. The final section features three chapters that highlight some of the actors and events in Stockholm, including the deliberations of nation states within the UN, conflicts within non-governmental organizations outside the UN, and debates by politically active environmental scientists who travelled to Stockholm. Politically, the global environmental moment crested and culminated with the planning and performance of those events surrounding Stockholm's environmental circus. It was there that the existing divides

between North and South on the rights and responsibilities for global environmental problems were institutionalized, and where any potential unity over global environmental challenges fractured, both inside and outside the UN.

To establish the conceptual and scientific foundations for the global environmental moment, Chapter 1 focuses on the development of systems thinking in twentieth-century science and technology and its evolution into an epistemology of global interconnection. Rather than separating or breaking down complexity into various components, systems thinking analyzes complex problems holistically in terms of their interdependent relations. The ascent of various scientific systems approaches during World War II contributed to the Allied victory, including Operations Research for organizing battles and the movement of men and material. The wartime development of another systems approach called cybernetics seemed to offer a science-based tool for comprehending, commanding, and controlling the behaviors of both machine technologies and living organisms. The parallel development of systems approaches in twentieth-century ecology, and its integration with cybernetic philosophies, promoted comprehension of the Earth's biogeochemical systems as integrated with humanity's technological and social systems. By the end of the 1960s, thinking in terms of systems had migrated beyond its original scientific and technological confines to signify an epistemology of holistic interconnection that was embodied by the symbol of Spaceship Earth. This popularized and holistic understanding of global interconnection triggered new realizations and concerns about the stability of the economic and ecological systems on which humanity depended. The development of global systems perspectives

among scientists and political leaders in the industrialized West was essential to the rise of global environmentalism and what became the global environmental moment.

Chapter 2 examines the growing realization, especially in the industrialized global North, that humanity's powerful technological and industrial systems threatened the ecological collapse of Earth's interdependent systems. The most powerful instrument for instigating that realization was the global environmental hazard of radioactive atomic fallout. From the mid-1950s through the early 1960s, fears about nuclear fallout, and its newly realized spread across vast continental and oceanic distances, created worldwide awareness and concern about the interconnected global environment. Building from fears about global nuclear fallout and the new danger of deadly radioactive particles in children's bones, additional environmental warnings by scientists evolved to include prognostications about massive famines and human die-off from overpopulation, as well as threats about future silent springs from the spraying of deadly chemicals. Popular environmental scientists and activists like Linus Pauling, Rachel Carson, Barry Commoner, Paul Ehrlich, and other experts like economists Kenneth Boulding and Barbara Ward argued that humanity's failure to recognize and protect the systems of environmental interconnection on Spaceship Earth were leading to planetary-scale eco-catastrophes. These warnings, and the worldwide scale of impact on which they spoke, all contributed to what soon flowered into the new global environmental moment.

This global environmental moment—a time that saw the dawn of a new environmental consciousness that spread globally to crescendo in a cluster of popular and political responses in Stockholm over the best means of solving global

environmental challenges—first originated in and addressed the particular concerns of the world's affluent and industrialized nations. Chapter 3 details how continued scientific admonition and growing public concern about widespread environmental hazards produced a multitude of popular and political responses, including the development in some influential nations in the global North of a grassroots environmental movement and new diplomatic efforts by their governments to coordinate international environmental policies for ameliorating those hazards. By the end of the 1960s, at the insistence of Sweden, the UN agreed to host a worldwide UN Conference on the Human Environment (UNCHE)—the UN's first single-issue conference at an intergovernmental and global scale—to address these growing environmental anxieties. Spurred by the continued warnings by leading environmental scientists and economists, growing numbers of political and popular actors in industrialized nations—in the United States, in Europe, and in Japan—questioned the costs of unrelenting growth and economic development, which had served as their unifying article of faith in the economic boom following World War II. Yet the explosion of environmental concern among nations and citizens in much of the global North inspired the first Earth Day in the United States, major political reform in Japan, and the formation of new national environmental agencies and institutions. As planning for the UNCHE slowly commenced in 1970, indications across the global North signaled a possibility for forming new global institutions to redirect and limit economic growth as part of the process for saving Spaceship Earth from environmental catastrophe.

However, for the majority of people living in relative poverty in the global South, their focus remained not on protecting the global environment but on promoting their economic development. While Chapter 3 reveals how influential actors in the largest and most dynamic industrial economies in the global North suggested redirecting and controlling economic growth in the name of the environment, Chapters 4 and 5 detail how nations from the global South, led initially by Brazil, used their numerical influence within the UN to co-opt the early evolution of global environmental politics to advance their immediate desires for economic development—even as environmental experts and systems analysts in the global North continued their calls for limiting economic growth.

Chapter 4 shows how Brazil reordered the UNCHE's early preparatory process by including the concerns of LDCs, namely by inserting economic development into the UN's international environmental policymaking. By doing so, Brazil helped lay the conceptual foundations for what later became the UN's primary agenda for environmental policy: sustainable development. In the first years of the 1970s, diplomats from Brazil's Foreign Ministry ensured that development became the dominant focus in the UN's emerging global environmental discourse, and they fiercely defended Brazil's national sovereignty to exploit national resources to advance its development. Brazil also introduced the concept of additionality, which suggested wealthy nations in the global North should take responsibility for global environmental pollution by providing additional funding to the global South for environmental protection beyond established commitments for foreign aid and international development.

By the end of 1970, the UNCHE's newly appointed Secretary-General, Maurice Strong centered conference planning on his notion that "the process is the policy." Rather than wait for the actual UNCHE to address political conflicts on global environmental issues, Maurice Strong's emphasis on the conference planning process meant Brazil's arguments about the sanctity of sovereignty and for environmental policies to promote, not limit, economic growth might ultimately shape the UNCHE's eventual achievements. Strong's first priority, however, remained making the UNCHE an actual global conference, which meant including wary LDCs in its planning process. By the beginning of 1971, Brazil's early efforts to reshape the UNCHE led to the introduction of a new major conference subject on "Environment and Development." Endeavoring to capture full LDC participation, Strong made this new topic central to the UNCHE and planned a series of meetings with LDCs for 1971 to incorporate their views on the UNCHE's planning process.

The tensions inherent in "Environment and Development" were on full display throughout 1971, featuring several significant events of the global environmental moment. Chapter 5 provides a detailed focus on those events with perspectives from both the global North and South. In June 1971, one year before the Stockholm circus commenced the following summer, Maurice Strong organized a meeting in Founex, Switzerland, where economic development experts from LDCs documented their reasons for a global synthesis of development and environment. The Founex seminar's report, *Development and Environment*, helped enlist for the UNCHE the full participation of LDCs. However, the same month as the Founex meeting, publication of a book called *World Dynamics* by Jay Forrester, a computer

modeler and systems scientist at MIT, renewed debate in the global North on the projected dangers of economic growth leading possibly to the collapse of Spaceship Earth's environmental systems. Amid that excitement, the United States that summer suddenly renounced its central position in the Bretton Woods economic system of currency valuation, which, for the first time since the end of World War II, created an opportunity for major renegotiation of the global economic order. Perhaps the UNCHE would provide a forum to re-align the global economy with the realities of global environmental interconnection.

By the end of 1971, after heated debate between ambassadors of Brazil and the United States in the UN General Assembly that year, Brazil and other LDCs successfully embedded the priority of development in all environmental planning with UN General Assembly Resolution 2849. In order to avert any economic renegotiations at the UNCHE that might try to limit economic growth for the sake of environmental protection, this resolution made concrete the demands by LDCs to ensure the protection of both sovereignty and development in the UNCHE's proposed Declaration and its recommendations for action. This LDC triumph limited any ambitions by environmental activists for the UNCHE to institutionalize the environment forcefully within a UN framework. I identify that resolution as the place where the conceptual roots for what later became the UN's sustainable development agenda were first formalized. Despite additional publication in early 1972 of popular studies in the global North that questioned the environmental dangers of economic growth, including the Club of Rome's *Limits to Growth* report,

the UNCHE became circumscribed in its options for finding solutions to global environmental problems even before it began.

Despite the UNCHE's inability to question the role of economic development as part of global environmental policymaking, Chapter 6 shows how the actual events that occurred in Stockholm during the UNCHE's ten days of meetings included some surprises and unexpected conflicts. For instance, while participating in their first major UN gathering in Stockholm, the communist People's Republic of China sought to make the UNCHE a forum for critiquing the U.S. war in Vietnam and, to do so, re-opened debate on the fragile draft of the UNCHE Declaration. Several days of tedious conflict over new and sometimes radical amendments to the Declaration threatened to destroy the UNCHE entirely. Literally at the midnight hour, following an inspiring speech by Indian Prime Minister Indira Gandhi, nations at the UNCHE finally approved by acclamation its slightly revised Declaration on the Human Environment, its Action Plan with 109 recommendations, and its establishment of the United Nations Environment Program (UNEP), later headquartered in Kenya as the first UN institution located in a LDC.

Despite political scientists' often uncritical celebration of the UNCHE as a watershed in global environmental politics, a closer look reveals continued conflict over the issues of growth and a mixed assessment on the success of LDCs in securing their development-centered rhetoric throughout the UNCHE's final documents. To be fair, massive international media attention to the UNCHE successfully promoted a new global environmental awareness, and widespread support of the UNCHE's documents projected a successful image of the UN

establishing international accord toward resolving the global environmental crisis. But the UN's non-binding language merely reinforced the pre-UNCHE status quo, with wealthy nations avoiding LDC injunctions for additionality and little actual progress toward resolving the growing global environmental problems that inspired the UNCHE in the first place. As such, the UNCHE offered an empty victory and its rhetorical institutionalization of development into environmental policy signaled an end to the global environmental moment. In the wake of the UNCHE, solutions to global environmental problems within the UN were significantly narrowed to revolve henceforth almost entirely in terms of more money, more technology, and more management, without questioning the social and economic values that contribute to global environmental challenges. In sum, the UNCHE enabled some progress toward nature protection and spurred global awareness of environmental challenges, but it did little to resolve the main problems at the root of the global environmental crisis: the social systems of development that reinforce inequality and reproduce patterns of ecological degradation.

But, as revealed in Chapters 7 and 8, the UN was not the only locus of action in the global environmental moment, nor the only forum participating in Stockholm's environmental circus. Due in part to the UN's refusal to reconsider the sacredness of national sovereignty and its inability to seriously explore conflicts between economic development and environmental protection, other actors in the global environmental moment arrived in Stockholm to debate and offer their own solutions for saving Spaceship Earth. Chapter 7 takes a step back before the UNCHE to trace the history of a unique non-governmental organization (NGO) named Dai

Dong, founded in 1969. Dai Dong was established and directed by a man named Alfred Hassler, who actively sought the advice and participation of environmental scientists and systems thinkers in promoting peaceful solutions to the global environmental crisis outside the limitations of the UN. As a life-long pacifist and leader in the International Fellowship of Reconciliation, Alfred Hasser founded Dai Dong as a transnational peace organization that appreciated the systems thinking framework of the global environmental moment and thus aimed to synthesize ecosystem ecology with notions of social justice.

Dai Dong expressed Hassler's conviction that only a transnational fellowship embodying Earth's interdependent systems and rejecting the divisions of national sovereignty could find solutions for the world's interconnected crises of war, overpopulation, its exploitation of natural resources by heedless economic development, and its related environmental destruction. Hassler thus became a knowledge broker of environmental science and ethics, especially through Dai Dong's promotion of the Menton Statement, which outlined his convictions for transnational solutions to environmental and other global challenges and was ultimately signed by thousands of the world's biologists. After the Menton Statement launched Dai Dong's meteoric rise in global environmental politics in 1971, Hassler's disapproval of the UN's insistence on national sovereignty encouraged Dai Dong to sponsor its own Independent Environmental Conference in Stockholm during the UNCHE in June 1972. Dai Dong's Independent Conference featured some thirty environmental experts from both the global North and South. At Stockholm, however, the Dai Dong conference fractured amid conflicts between

scientists originally from LDCs and experts from the North, particularly over Hassler's cherished issues of national sovereignty and neo-Malthusianism. After its unsuccessful attempt to create transnational unity during Stockholm's environmental circus, Dai Dong soon disbanded and by 1974, Alfred Hassler slipped into his retirement from his prior peace and environmental activism. The rapid rise and fall of Dai Dong offers contemporary lessons on the limits of transnational environmentalism while its comparison to other global environmental NGOs like Friends of the Earth reveals how environmental activism and national sovereignty need not exist in total opposition.

Chapter 8 also takes a step back before the UNCHE to explore the acrimonious debate between environmental scientists and activists Barry Commoner and Paul Ehrlich over the causes of the global environmental crisis—and, therefore, the means to its solution. After reviewing the roots of their conflict at the dawn of the global environmental moment, this chapter explains the context of their participation in Stockholm's environmental circus in 1972. Both Commoner and Ehrlich appeared at the Environment Forum in Stockholm, a semi-official alternative conference for environmental NGOs, held simultaneously during the UNCHE. At the Environment Forum in Stockholm, Ehrlich began speaking about population control when his stage was overtaken by a group of radical Third World scientists affiliated with Commoner and led by an Iranian biologist, Taghi Farvar, who was Commoner's star graduate student and who, earlier, had created divisions at Dai Dong's Independent Environmental Conference in Stockholm. At the Environment Forum, Farvar and his collective of Third World scientists justified their

commandeering of Ehrlich's talk as an anti-imperialist assault against Ehrlich's neo-Malthusian calls for coercive population control. In Stockholm, the Commoner-Ehrlich debate became not only a conflict between leading experts over the science behind the environmental crisis; it evolved into a conflict over national sovereignty and the right of recently decolonized LDCs to confront the environmental crisis on their own terms. In that way, the conflicts displayed during the Environment Forum actually reflected similar conflicts between the global North and South during the UNCHE planning and its events in Stockholm.

Legacy of the Global Environmental Moment

Seen as a heterogeneous whole, the various conferences of Stockholm's environmental circus constituted a missed opportunity in which nation states, scientists, and civil society were unable to agree on how environmental realizations would fit into the future path of social and economic development on Earth. Instead of the major changes to human values, economics, and international politics that the correction of global environmental hazards demanded, the major structures of modernity emerged unimpeded; the status quo of industrial development and economic growth led by sovereign nation states remained the same as it had been before realization of the environmental crisis.

New issues like climate change and the destruction of Earth's atmospheric ozone layer have arisen since the dawn of the global environmental moment in the late 1960s and early 1970s. Yet today's global environmental politics over how to save Spaceship Earth still remain fractured in debate over the issues of additionality,

the sovereign rights of resource use, the responsibility of who should pay to protect the global commons, whether environment and development can be reconciled, and, for some, even conflict over whose science is right or wrong on global environmental issues. As the climax of the global environmental moment, Stockholm's failures left the legacy in which, today, global environmental politics remains deadlocked in debate between North and South over variations of similar unresolved environmental concerns and threats first addressed in Stockholm, forty years earlier.

By highlighting the early scientific and conceptual framing of Spaceship Earth and by providing a detailed study of global political dynamics over how to best manage Spaceship Earth both before and during Stockholm's environmental circus, this dissertation seeks historical answers to when and why global environmental politics became stagnated on the North-South divide over what corrective actions should be taken and who should pay for them. It highlights the complex links between stories and ideas about environmental change over time, the science and knowledge used to bolster those stories, and the political, social, and economic forces motivating the use of one particular story over another. This dissertation therefore traces the history of whose knowledge, discourse, and science became dominant over time, why it happened the way it did, who won and who lost in this process, and what legacies it established for contemporary frameworks of environmental diplomacy. This detailed study of the global environmental moment begins with the rise of Spaceship Earth to help us understand where it and its precious cargo have traveled since.

Chapter 1

SEEING SYSTEMS, GOING GLOBAL:
Systems Thinking and the Rise of Spaceship Earth

I know that age to age succeeds,
Blowing a noise of tongues and deeds,
A dust of systems and of creeds.
—Alfred Lord Tennyson, *The Two Voices*, 1832.

"If someone were to analyze current notions and fashionable catchwords, he would find 'systems' high on the list. The concept has pervaded all fields of science and penetrated into popular thinking, jargon, and mass media."
—Ludwig von Bertalanffy, Introduction to *General System Theory,* 1967.

Just five days before his sudden death at age sixty-five, in the summer of 1965, Adlai Stevenson delivered his last public speech before the world community of the United Nations (UN), which he had helped create two decades earlier. Stevenson, then American ambassador to the UN, delivered his final oratory in Geneva to the United Nations Economic and Social Council (ECOSOC), the UN's central forum for international social and economic issues. Before representing the United States in the UN, Stevenson helped found the UN in the late 1940s; he served as governor of Illinois; and twice, in 1952 and again in 1956, he had accepted the Democratic nomination in unsuccessful bids for the U.S. Presidency. In 1965, before the ECOSOC council, Stevenson emphasized the need for international politics to expand both economic development and benevolence. Our survival, he believed, depended on such expansion of thought and deed. Stevenson's long speech detailed a world divided not just between East and West—between the Cold War's communism and democracy—but a world split North and South—between nations

rich and poor. Stevenson's final statement on the global stage concluded with a now-famous warning about the planetary need for political and ecological interdependence.

In the original notes for his speech, Stevenson underscored particular points of interconnection and mutual reliance. "We travel *together*," Stevenson emphasized, "passengers on a little space ship, *dependent* on its *vulnerable* reserves of air and soil; all committed for our safety to its security and peace; preserved from annihilation only by the care, the work, and I will say, the love we give our fragile craft." Stevenson portrayed humanity as a unified species on planet Earth, and, famously, he extended the imagery of planet Earth as a spaceship, later designated Spaceship Earth. He concluded with a warning about the global split in wealth between North and South: "We cannot maintain [our fragile craft] half fortunate, half miserable, half confident, half despairing, half slave—to the ancient enemies of man—half free in the liberation of resources undreamed of until this day. No craft, no crew can travel safely with such vast contradictions. On their resolution depends the survival of us all."[19] Just before leaving this world, Stevenson warned that Spaceship Earth, and human survival on it, required recognition of its inherent interdependencies on a worldwide scale.

[19] Adlai Stevenson, "Strengthening the International Development Institutions," July 9, 1965, in *The Papers of Adlai E. Stevenson, Vol. VIII: Ambassador to the United Nations, 1961-1965*, edited by Walter Johnson (Boston: Little, Brown, and Company, 1979), 814-828, quote on 828, with emphasis in the original typewritten copy that Stevenson used when delivering the speech. This speech was also published in Department of State *Bulletin*, July 26, 1965, just after Stevenson died. Stevenson alluded to Abraham Lincoln's "House Divided" speech from June 1858, where Lincoln declared "A house divided against itself cannot stand," which itself alludes to Biblical statements in the three synoptic gospels.

In the tumultuous years that followed, throughout the late 1960s and early 1970s, this vision of Spaceship Earth—as a fragile craft, interconnected and requiring great care for the ongoing survival of its passengers—grew as part of a burgeoning environmental movement. Environmental concerns in the 1960s first blossomed in the industrialized nations of the global North, but by the end of the decade, they spread to encompass nations, organizations, and individual actors all across the planet.[20] That initial wave of worldwide environmental awareness and concern produced what I call the global environmental moment, in which international and intergovernmental environmental conferences soon met to debate and reassess the environmentally destructive trajectories of modernization and industrial development—most notably at several conferences that arose in relation to the 1972 United Nations Conference on the Human Environment (UNCHE), held in Stockholm, Sweden. Yet, how did the actors who planned and participated in these meetings develop their world-scale vision? What scientific framing enabled their conception of Earth as a vast system of interdependent systems? In short, what were the scientific and conceptual genealogies that fostered the symbol of Spaceship Earth?

This chapter argues that the conceptualization of Spaceship Earth, which helped nourish the global environmental moment, built on the technological and scientific developments associated with the discourse of systems thinking during World War II and in the early decades of the Cold War—especially the post-war intersection of ecosystem ecology with the supposedly universal language of

[20] John McCormick, *The Global Environmental Movement* (West Sussex, UK: John Wiley &

cybernetics. In 1965, Adlai Stevenson introduced a global audience at the UN ECOSOC council to his vision of Spaceship Earth—a planetary-scale conception of social, political, economic, and ecological interconnection and interdependence. Stevenson's sudden death after his speech helped popularize for the world the vernacular of Earth as a spaceship. However, this chapter explains how that imagery emerged from the scientific discourse of systems thinking, which had evolved over several decades during and after World War II to eventually identify Earth and everything upon it as part of a unified system.

It is no coincidence that a US ambassador to the UN espoused this planetary-scale vision of integrated social, ecological, and technological systems. While the Soviet Union first launched humanity into the space age with *Sputnik I*, it was American science and technology that, in 1968, first sent humanity outside of Earth's orbit and, in 1969, enabled men to walk on the moon and return safely back to Earth. While flying on those voyages and upon looking back at our home planet, many of the men involved in those great adventures—and they were all men—experienced a profound realization about Mother Earth's stark beauty against the black void of space. For the first time in our species existence, they saw our planet as a whole, as inherently unified by lands and seas without political boundaries, and endowed with resilient yet fragile biological systems of interconnection that made Earth a living planet. In so doing, American science and technology helped midwife

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Sons, 1995); Ramachandra Guha, *Environmentalism: A Global History* (New York: Longman, 2000).

a new planetary consciousness on the unified nature of life on our shared planet, which Stevenson described as the fragile little craft on which we traveled together.[21]

Stevenson's imagery of Earth as a spaceship signified a new means of thinking globally in terms of interconnection and interdependence. Systems thinking, or what historian Thomas Hughes described as "the systems approach," envisioned all of reality in the holistic terms of systems—a vision that could be extended to encompass all of the Earth itself as a unified system.[22] Systems thinking did not directly equate with global thinking, but the evolution of thinking in terms of systems in the post-World War II period did expand conceptually to envision interconnections at a planetary scale. Historian Paul N. Edwards noted that "it is really only since the Second World War that that 'the world' has become a system in political, economic, and cultural terms."[23] Systems thinking provided the key conceptual and, importantly, scientific basis for understanding the Earth and its living inhabitants as integrated and interdependent, both ecologically and politically. Bolstered by the authority of science, post-war systems thinking thus became a primary factor in producing the global environmental moment that later culminated in Stockholm's collection of conferences on the global environmental crisis.

The rise of systems thinking emerged initially from the exigencies of global-scale warfare and the development of new technologies during the Cold War.

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[21] Robert Poole, *Earthrise: How Man First Saw the Earth* (New Haven, CT: Yale University Press, 2008).

[22] Thomas P. Hughes, *Rescuing Prometheus* (New York: Parthenon, 1998), 141-195.

[23] Paul N. Edwards, "The World in a Machine: Origins and Impacts of Early Computerized Global Systems Models," in Agatha C. Hughes and Thomas P. Hughes, *Systems Experts and Computers: The Systems Approach in Management and Engineering, World War II and After* (Cambridge, MA: MIT Press, 2000), 221.

Scientific systems thinking, and what evolved into the concept of Spaceship Earth, find their roots in the convergence of several scientific developments, first from the quantified operations of organizing world wars, and then with the invention of new mathematical theories about commanding and controlling machines and animals, alike. The success of systems thinking in those ventures paralleled its evolution in a host of different disciplines, especially ecology and the earth sciences. The expansion of systems thinking established new realizations about Earth as an integrated system, just as systems engineers were constructing spaceships that, for the first time, blasted humans beyond the biosphere. By the mid-1960s, systems thinking also resonated with a broad public and among professionals in civil government. For many professionals, especially in the industrialized world, the systems approach had become a prevalent epistemological view of ecological, technological, and social behaviors. By the end of the 1960s, thinking in terms of systems had migrated beyond its original scientific and technological confines to signify a social and ideological perspective of holistic interconnection—a vision embodied by the symbol and discourse surrounding Spaceship Earth.[24]

Quantified Systems for Global Understanding

What is a system? At its most basic, a system is an organized or connected group of objects. As a concept, it can be applied to any number of organized forms,

[24] Robert Poole, *Earthrise: How Man First Saw the Earth* (New Haven, CT: Yale University Press, 2008), 155-160; Linda Sargent Wood, *A More Perfect Union: Holistic Worldviews and the Transformation of American Culture after World War II* (New York: Oxford University Press, 2010); Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems*

from the particles of atomic physics or the living organisms of biology, to the prevailing political, economic, or social order. A system's collection of objects is interconnected in such a way that they produce their own pattern of behavior over time. A system, therefore, is a set of relations whereby the adjoined objects feedback on each other to produce an outcome. The system may be nudged, constricted, provoked, or induced by outside forces. But the system's response to those forces is characteristic of itself. The same outside forces applied to a different system would likely produce an entirely different response.[25]

The relationship between structure and behavior determines how a system works and what results it will produce. A system with a complex structure typically exhibits a complex behavior—the more complex the system's structure, the more complex its behavior. Complex systems also tend to produce more complex final results. Understanding the relations between structure and behavior provides insight for how to restructure a system to produce different patterns of behavior and obtain different results. Understanding and thinking in terms of systems enables the identification of the root causes of complex problems, which creates opportunities for the solution of those complex problems.[26]

Early systems methods applied mathematical formulas to multiple variables as a means to, for example, manage the most effective use of resources for the

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Theory (Boulder, CO: University Press of Colorado, 2003); Robert Lilienfeld, *The Rise of Systems Theory: An Ideological Analysis* (New York: John Wiley & Sons, 1978).

[25] Donella H. Meadows, edited by Diana Wright, *Thinking in Systems: A Primer* (White River Junction, VT: Chelsea Green Publishing, 2008), 1-34.

[26] Donella H. Meadows, edited by Diana Wright, *Thinking in Systems: A Primer* (White River Junction, VT: Chelsea Green Publishing, 2008), 1-34; Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder: University Press of Colorado,

production of goods or for their most efficient distribution. Historian of technology, Thomas P. Hughes, revealed a nascent consciousness of systems thinking in several mechanical developments: in the engineering and early development of electrical power networks, in Fredrick W. Taylor's efforts to improve efficiency, and in Henry Ford's intensive methods of industrial production in the late nineteenth and early twentieth centuries.[27] These roots of systems thinking emerged from the quantified forces of mechanical engineering. In addition to advancing technological development, rational quantification came progressively to signify authoritative knowledge and scientific legitimacy.

Quantification provided a logical basis for objectivity, and its increased use in science added to the legitimacy of science in defining nature's basic laws. For centuries, philosophers and scientists alike noted that nature seemed to behave in accord with the quantifiable rules of mathematics, which in turn seemed to translate the language of nature.[28] Yet, as historian Paul N. Edwards noted, "even long after the Scientific Revolution, when 'the world' had become for many an immense but finite globe, comprehending the forces that act upon it as a whole—as a system—remained for the most part beyond reach."[29] Developments in the mid-twentieth

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2003), 11-18; Gerald M. Weinberg, *An Introduction to Systems Thinking* (New York: John Wiley & Sons, 1975).

[27] Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983); Thomas P. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm* (New York: Penguin, 1990).

[28] Sungook Hong, "History of Science: Building Circuits of Trust", *Science* 305:5690 (September 10, 2004), pp. 1569-1570. See also, Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society* (Cambridge: Cambridge University Press, 1996).

[29] Paul N. Edwards, "The World in a Machine: Origins and Impacts of Early Computerized Global Systems Models," in Agatha C. Hughes and Thomas P. Hughes, eds., *Systems, Experts, and Computers: The Systems Approach in Management and Engineering, World War II and After* (Cambridge, MA: MIT Press, 2000), 221-253, quote pg 221.

century helped bring an understanding about those global systems within reach. The success of the systems approach for comprehending vast and diverse forces of integration eventually led systems thinking to evolve from its hard quantification in science and technology to a softer and generalized conceptualization about imperiled ecological, economic, and political systems of integration on Spaceship Earth.

Most historical accounts credit the exigencies of World War II for the technical and institutional flowering of the systems approach, where it enabled more efficient movement of men and material, and increased the effectiveness of aerial bombardments and defense.[30] In a global war that required massive systems of production for assaults in multiple arenas of battle, Allied military planners sought rationalized and objective war operations. Professional scientists and mathematicians thus applied their quantification and computation abilities to help coordinate the activities of diverse actors across dynamic theaters of global warfare. During World War II, systems thinking appeared in various forms and under different names, including operations research, systems engineering, cybernetics, systems analysis, and systems dynamics. Physicists and mathematicians became particularly valuable for their skills in modeling probabilistic systems. Through the language of numbers, quantification, and mathematics, scientists drafted into wartime projects emphasized

[30] For the flowering of systems thinking in World War II, see Agatha C. Hughes and Thomas P. Hughes, *Systems Experts and Computers: The Systems Approach in Management and Engineering, World War II and After* (Cambridge, MA: MIT Press, 2000), especially David A. Mindell, "Automation's Finest Hour: Radar and System Integration in World War II," pp. 27-56, and Erik P. Rau, "The Adoption of Operations Research in the United States during World War II," pp. 57-92.

the objectivity of their systematic approaches, which lent twentieth-century systems thinking scientific credibility.[31]

For example, the British, soon followed by the Americans, applied a quantitative systems approach to maximize the efficiency of their war efforts, especially against German U-boats. American war planners, who described this systems approach as operations research, or simply OR, eventually applied it to almost all of their war planning efforts. Essentially, OR used mathematical analysis to synthesize simultaneously the observational data on all the elements of logistical and tactical war planning. Instead of maximizing the performance of *individual* elements in a system, OR's quantitative analyses offered military commanders the best possible *combinations* of those elements, which extended the application of existing weapons or improved the efficiency of existing systems of production.[32]

British and American scientists applied an OR systems approach by analyzing German U-boat diving patterns in tandem with the results of Allied reconnaissance methods. After creating mathematical formalizations of the problem, teams of wartime scientists and mathematicians ascertained ideal aerial searching strategies, determined optimal patterns and sizes for naval convoys, and established new fuse settings for depth charges. The synthesis of their applied OR adjustments immediately tripled the Allied destruction of German U-boats, leading German forces to assume incorrectly that Britain had designed a deadly new explosive.

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[31] Theodore M. Porter, "Quantification and the Accounting Ideal in Science," *Social Studies of Science* 22:4 (November 1992): 633-652; M. Fortun and S. S. Schweber, "Scientists and the Legacy of World War II: The Case of Operations Research (OR)," *Social Studies of Science* 23:4 (November 1993): 625-628.

British and American scientists, however, had simply used a quantified systems approach to better manage their war efforts.[33]

Due to its successes, the systems methodologies of OR expanded rapidly with analytical evaluations of other complex organizations and operations, both biological and technological. Historians M. Fortun and S. S. Schweber explained that OR eventually became "an integral element in the planning of the major campaigns - including strategy and logistics, the training and management of manpower, the cost effectiveness of weapons, and the allocation of resources." OR approaches initially synthesized biology and technology by integrating in its calculations both human personnel and the machines and technologies of war. The systems studies of OR not only helped identify where to most effectively amass men at battlefronts, it also offered technological solutions. For instance, the OR approach outlined the most favorable formation for pilots flying bombing squadrons, the most advantageous armoring and arming of airplanes, and the best or likely location for human-aimed anti-aircraft artillery. By the end of the war, the U.S. Army Air Force had created OR divisions in all of its units.[34] After the war, the 1947 book *Science at War* celebrated the "reduction of war to a rational process" and emphasized the importance of systems thinking to World War II. "Systematic scientific work on

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[32] Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996), 115.

[33] Ibid.

[34] M. Fortun and S. S. Schweber, "Scientists and the Legacy of World War II: The Case of Operations Research (OR)," *Social Studies of Science* 23:4 (November 1993): 595-642, quote on 602; Erik P. Rau, "The Adoption of Operations Research in the United States during World War II," in Agatha C. Hughes and Thomas P. Hughes, eds., *Systems, Experts, and Computers: The Systems Approach in Management and Engineering, World War II and After* (Cambridge, MA: MIT Press, 2000), pp. 57-92; see also, James Phinney Baxter III, *Scientists Against Time* (Boston: Little, Brown, 1948).

known weapons," it argued, "paid larger and quicker dividends. It beat Hitler."[35] Systems thinking during World War II proved eminently successful tool for seeing and manipulating interconnections across vast scales when fighting a global war.

A Universal System of Command and Control

Cybernetics, another important systems approach that later intersected with the social sciences and ecology as part of the concepts coalescing into Spaceship Earth, also emerged during World War II. Cybernetics arose out of Allied efforts to design antiaircraft devices as servomechanisms—a mechanical device that senses its environment and automatically adjusts its action or output accordingly. Before the development of antiaircraft servomechanisms, the inept accuracy of antiaircraft guns wasted vast amounts of ammunition attempting to bring down disappointingly few enemy aircraft—aircraft that became increasingly faster and more maneuverable. To solve that problem, wartime engineers, mathematicians, and physicists collaborated to design and construct servomechanisms that combined the new technologies of environment-sensing radar and calculating analog computers with artillery cannons. Analog computers, applied to artillery guns, calculated an enemy plane's probable future position based on inputs from radar. The servomechanism quantified and combined this information to automatically adjust the cannon's next shot. The design process for creating antiaircraft servomechanisms built on of well-known concepts for self-regulating and self-reinforcing feedback. Feedback in self-regulating systems

[35] J.G. Crowther and R. Whiddington, *Science at War* (New York: Philosophical Library, 1947), cited in M. Fortun and S. S. Schweber, "Scientists and the Legacy of World War II: The Case of Operations Research (OR)," *Social Studies of Science* 23:4 (November 1993): 625.

like thermostats occurred when the mechanical system's action in an environment affected that environment and fed back to affect the system's future action, thus making a circuit or loop of cause-and-effect. During the design and construction of these antiaircraft devices, the potential application of feedback controls to human operators eventually inspired an entirely new mode of systems thinking called cybernetics.[36]

Norbert Wiener, a mathematics professor at MIT, played a central role in the development and promotion of cybernetics. In 1941, Wiener joined an interdisciplinary team of scientists under U.S. government sponsorship at MIT's Radiation Laboratory, where they explored the challenges of servomechanism design. Servomechanisms sought an interactive and automated anti-aircraft system that could respond to changing dynamics in its surrounding environment based on limited information, which was constantly updated, fed back into the system, and recalculated again. Out of efforts to predict an aircraft's future trajectory from its velocity and current location, Wiener, along with American engineer Julian Bigelow and Mexican neurobiologist Arturo Rosenblueth, formulated a very general statistical theory of prediction and control based on incomplete information. This theory, which they called feedback control, provided the basis of servomechanism designs that placed soldiers, calculating machines, and artillery power into a single integrated system. By developing a theory that could control dynamic behavior of machines co-operated by humans, Wiener, Bigelow, and Rosenbluth next realized

[36] Peter Galison, "The Ontology of the Enemy: Norbert Weiner and the Cybernetic Vision," *Critical Inquiry* 21:1 (Autumn 1994), 228-266; Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996), 45, 180.

the theory could apply directly to humans, and perhaps to any biological organism with a central nervous system that operated in an environment and adjusted its behavior according to changes in that environment.[37]

Weiner, Bigelow, and Rosenblueth comprehended that, in general, information feedback not only helped their machines predict future positions of moving aircraft, it also helped humans predict an aircraft's future position. By extension, then, the theory of feedback control seemed to offer a mathematical system equally applicable to controlling calculating machines as to a nervous system's calculations for controlling an animal's behaviors, including the human animal. Conceptually, the theory of information feedback integrated humans and machines in a unified system of command and control; both machines and organisms could be considered and treated as components of manageable systems, even integrated in a single system. In 1942, Rosenblueth presented their theory to a small interdisciplinary meeting organized under the sponsorship of the Josiah Macy Jr. Foundation. Leading psychologists, neurologists, and social scientists, including the anthropologists Margaret Mead and Gregory Bateson, attended the meeting and left excited. They wanted further explorations on feedback concepts and their potential application to various fields of inquiry.[38]

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[37] Arturo Rosenblueth, Norbert Wiener, and Julian Bigelow first articulated this theoretical extension in their paper, "Behavior, Purpose, and Teleology," *Philosophy of Science* 10 (1943): 18-24. See also Peter Galison, "The Ontology of the Enemy: Norbert Weiner and the Cybernetic Vision," *Critical Inquiry* 21:1 (Autumn 1994), 228-266, especially 235-240 and 245-252; Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996), 182-183.

[38] Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996), 180-182.

In 1943, Wiener, Bigelow, and Rosenblueth published a foundational paper that compared servomechanisms' purposeful behavior as similar to the behavior of living organisms through the functions of negative feedback. Negative feedback, they explained, consisted of information cycled through a dynamic, self-corrective, and purpose-oriented system. The cycled information replenished a device, a human, or another organism with information on the effects of an earlier adjustment to its surrounding environment, which it could then use to refine and control future adjustments towards its goal.[39] Structurally, machines and organisms may be different, but they could be classified similarly as purposeful and, based on their prior actions, predictive. Behavior became purposeful when the cycles of information and adjustment guided a machine or organism toward a goal. Out of these realizations emerged a new systems science that Wiener later named cybernetics.[40]

Wiener based the term cybernetics on the Greek root *kybernetes*, meaning "steersman" or "helmsman," with his clear emphasis on guiding, directing, and controlling the direction of a ship. No surprise, then, that the following decades saw widespread extension of systems thinking beyond these scientific confines to help shape the global systems metaphor of Spaceship Earth. According to Wiener, cybernetics promised "control and communication in the animal and the machine."

[39] While negative feedback narrows or reduces changes to control a system and make it more stable, positive feedback amplifies the magnitude of a system disturbance. For instance, loud noise or a wolf might cause some animals in a group to panic and run, which creates a positive feedback for other animals in the group to panic and run, thus amplifying the system toward increased panic and stampede.

[40] Arturo Rosenblueth, Norbert Wiener, and Julian Bigelow, "Behavior, Purpose, and Teleology," *Philosophy of Science* 10 (1943): 18-24; Norbert Weiner, *Cybernetics, or Control and Communication in the Animal and the Machine* (Cambridge, MA: MIT Press, 1961, c1948).

Wiener's further development of cybernetic ideas during World War II attracted the attention of key thinkers in a several fields, including that of his friend and colleague at MIT, John von Neumann. Von Neumann, a mathematician and polymath, made pioneering contributions to a variety of sciences, from pure mathematics to quantum physics, and from economics to computer programming. During World War II, von Neumann served as a principle member of the Manhattan Project to build the world's first nuclear bomb, and he later calculated key steps of nuclear physics involved in the thermonuclear reactions of hydrogen bombs.[41] Although cybernetics was rooted in machine theories of information, it offered for Weiner, von Neumann, and others a mathematical approach that appeared applicable universally to all self-organizing and self-regulating systems, from biological systems of cells to the social systems of civilizations, and therefore from neuroscience and social psychology to economics and ecology. Here we see the emergence of a science-based systems thinking that aimed grandly, if naively, to provide a universal language applicable to all reality.[42]

In January 1945, as World War II drew to a close, Weiner and von Neumann organized a meeting with selected colleagues to further explore the application of cybernetics to other fields, including as a unified mathematical formulation to describe the control of both mechanical devices and biological systems. The interest and excitement generated at that meeting encouraged the Josiah Macy Jr. Foundation to fund, beginning in 1946, a series of interdisciplinary conferences eventually titled,

[41] Steve J. Heims, *John von Neumann and Norbert Wiener, from Mathematics to the Technologies of Life and Death* (Cambridge, MA: MIT Press, 1980); Norbert Weiner, *Cybernetics, or Control and Communication in the Animal and the Machine* (Cambridge, MA: MIT Press, 1961, c1948).

"Cybernetics: Circular Causal and Feedback Mechanisms in Biological and Social Systems." Macy Conference attendees included a diverse group of twenty to thirty regular participants with a handful of invited interdisciplinary guests. Attendees included philosophers, engineers, mathematicians, psychologists, neuroscientists, anthropologists, sociologists, and ecologists.[43] The ten Macy Conferences held between 1946 and 1953 played a significant role in spreading the concepts of post-war systems thinking—especially cybernetics, but also the systems approach generally—from the confines of mathematics, and engineering to a host of other academic disciplines. As historian Peter J. Taylor has argued, the Macy Conferences popularized in many academic fields "the perspective that complex systems can be treated as self-regulating feedback systems."[44]

Early advocates of cybernetics like Weiner and von Neumann purposely cast it as a meta-theory, or an explanation of how everything is connected to everything else—a phrase that biologist and environmental activist Barry Commoner would adopt twenty-five years later when defining his laws of ecology.[45] The cybernetic concepts of negative feedback for self-regulating systems were nothing new. What was new, however, was the generalization of these ideas into universal principles that applied to the quantification of artificial and organic materials, and the embodiment of these concepts in entirely new orders of technology like

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[42] Geof Bowker, "How to Be Universal: Some Cybernetic Strategies, 1943-70," *Social Studies of Science* 23:1 (February 1993), 107-127.

[43] Steve J. Heims, *The Cybernetics Group* (Cambridge, MA: MIT Press, 1991); Heinz von Forester, ed., *Transactions of the Conference on Cybernetics*, Five Volumes (New York: Josiah Macy Jr. Foundation, 1950-1955).

[44] Peter J. Taylor, "Technocratic Optimism, H. T. Odum and the Partial Transformation of Ecological Metaphor after World War II," *Journal of the History of Biology* 21 (1988): 219.

servomechanisms and early computers. Cybernetics quickly became allied with a collection of technical and theoretical endeavors in the post-war information sciences, including OR, computer science, game theory, and information and communication theory. Philosopher of science Geof Bowker noted that the concepts of cybernetics were elusive, yet "this elusive quality itself bolstered the universality of the language, making cybernetics a general approach to the world."[46] The concepts of communication and control developed at the Macy Conferences extended not just to information technologies, but to the natural and social sciences as well.[47]

One social scientist, Lawrence Frank, an economist and Macy Conference regular, wrote in 1948 of the Macy Conference explorations that "we are engaged, today, in one of the major transitions or upheavals in the history of ideas, as we recognize that many of our older ideas and assumptions are now obsolescent and [we] strive to develop a new frame of reference."[48] The unifying feature for the interdisciplinary complex of ideas accompanying cybernetics, and the new and developing frame of reference to which Lawrence Frank alluded, was the recognition of controlling systems of systems, or an attention to and integration of whole systems, including those that moved toward the planetary scale of Spaceship Earth.

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[45] Barry Commoner, *The Closing Circle: Nature, Man, and Technology* (New York: Alfred A. Knopf, 1971), 33-48.

[46] Geof Bowker, "How to Be Universal: Some Cybernetic Strategies, 1943-70," *Social Studies of Science* 23:1 (February 1993), 107-127.

[47] Evelyn Fox Keller, *Refiguring Life: Metaphors of Twentieth-Century Biology* (New York: Columbia University Press, 1995), 83-85; Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996), 407n33, 188-189; Geof Bowker, "How to Be Universal: Some Cybernetic Strategies, 1943-70," *Social Studies of Science* 23:1 (February 1993), 107-127.

[48] Lawrence Frank, Forward to *The New York Academy of Sciences* 50 (1948), 192.

The cybernetic concept's appreciation of whole systems and its theoretical integration of technology with the biological systems of nature soon factored into the related development of systems thinking in the field of ecology.

Ecological Epistemologies

In 1971, when Barry Commoner outlined his laws of ecology for a popular audience then concerned about humanity's impact on Spaceship Earth's environmental systems, he explained "our ability to picture the behavior of such systems has been helped considerably by the development, even more recent than ecology, of the science of cybernetics."[49] For Commoner and others concerned about the stability of Spaceship Earth, cybernetics helped them "see" the interaction of complex environmental and technological systems at a global scale. The application of cybernetics to ecology first occurred at a Macy Conference in 1946, as part of the work of G. Evelyn Hutchinson, a British-born ecologist at Yale University. By the late 1940s, even before the Macy Conferences explored unifying concepts of cybernetic feedback in other fields of natural and social science, Hutchinson was already thinking about the planetary-scale interconnections of living systems with inert systems, including human technological systems. Yet Hutchinson's contributions built upon a deeper evolution of ecological thinking that synthesized biology with physical and chemical interactions. Before we get to Hutchinson's intersection of cybernetics with ecology in the 1940s and the evolution of ecological systems thinking into the symbol of Spaceship Earth, we must first explore the

separate development of a systems approach in ecology, which had evolved since at least the nineteenth century.[50]

In 1866, upon reading Darwin's theory of evolution, the German zoologist Ernest Haeckel coined the term "ecology" (*oekologie*) in his synthetic, two-volume work, *General Morphology of Organisms* (*Generelle Morphologie der Organismen*). Haeckel used the Greek root *oikos*, meaning household or family, as reference to studying an animal's relations with its organic home or environment. The linguistic inception of ecology was also analogous to economy, from the Greek notion of *oeconomicus*, meaning rules and laws (*nomos*) of the house (*oikos*), which dealt with the efficient management of resources through interconnected market relations. Over a century later, the forces of ecology and economy would clash during the global environmental moment as a conflict between "Environment and Development." But, at their linguistic roots, both ecology and economy signified systemic notions of interconnection.[51]

In the early twentieth century, ecological researchers embraced an organic model of interaction between living organisms and their environments, which in retrospect appears as a very generalized form of systems thinking. American ecologist Frederick Clements developed influential ecological theories by

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[49] Barry Commoner, *The Closing Circle: Nature, Man, and Technology* (New York: Alfred A. Knopf, 1971), 33.

[50] Donald Worster, *Nature's Economy: A History of Ecological Ideas*, Second Edition (New York: Cambridge University Press, 1994).

[51] Ernst Haeckel, *General Morphology of Organisms: Principles on the Science of Organic Forms, Mechanically Based on Charles Darwin's Reformed Theory of Descent* (*Generelle Morphologie der Organismen. Allgemeine Gründzüge der organischen Formen-Wissenschaft, mechanisch begründet durch die von Charles Darwin reformierte Decendenz-Theorie*), 2 vols. (Berlin: Reimer, 1866); Gregory Cameron, "*Oikos* and Economy: The Greek Legacy in Economic Thought," *PhaenEx* 3:1 (spring/summer 2008): 112-133.

envisioning plants as a developing community that eventually climaxed in a stable system of natural harmony. In 1905, Clements described the entirety of a plant community, such as a forest and all of its various living components, as a singular "complex organism." Clements also saw the interacting parts of a plant community corresponding to the interactions of cells in an individual organic body. He believed large plant communities progressed through a unified life cycle similar to the processes of a single organism. Clements argued that, as a holistic unit, a plant community worked ultimately toward maturity and the maintenance of its whole entity in a stable, homeostatic state of equilibrium that he described as a plant community's "climax." Later ecologists like Paul R. Ehrlich rejected Clements's conception of stable climax communities, particularly in terms of animal populations. However, Clements's ideas played a significant role in promoting popular notions about the "balance of nature" seeking an enduring ecological equilibrium. Later in the century, ideas of ecological equilibrium would feed arguments for saving Spaceship Earth by limiting economic growth that upset supposed environmental balances.[52]

Also in the early twentieth century, other ecologists like Charles C. Adams at the University of Chicago saw both plants and animals in a similar set of systemic relations, though less in terms of Clementsian stasis and more in terms of energy exchanges. In 1913, Charles C. Adams published his *Guide to the Study of Animal*

[52] Frederick Clements, *Research Methods in Ecology* (Lincoln: University Printing Company, 1905); P. R. Ehrlich and L. C. Birch, "The 'Balance of Nature' and 'Population Control,'" *The American Naturalist* 101:918 (March-April 1967): 97-107; Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, William W. Behrens III, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Universe Books, 1972).

Ecology, which outlined a "dynamic-process" of animal ecology built around the thermodynamic flow of energy and the circulation of matter. For Adams, organisms were dynamic energy transformers. Borrowing concepts from chemistry and particle physics, Adams built his notion of biological interconnection up from the elementary particles of atoms, beyond Clementsian climax communities, and ultimately toward seeing the entire web of organic matter in an interrelated system of systems. Adams wrote,

> From electrons, atoms, molecules, chemical compounds, colloids, cells, tissues, organs, individuals, and culminating in the community and association, is seen in each dynamic center or microcosm, about which revolves other systems, in turn revolving as a part of a larger system in ever widening expansion, each in turn subordinate to a higher order of dominance, the culmination of interacting systems.[53]

Adams viewed the processes of ecological change as hierarchic and as comprehensively biological, geological, chemical, and physical, whereby energy changed form and circulated through both the environment and the organism. This ecological notion of an energy-circulating system of systems likewise provided grounding for later ideas about Spaceship Earth as a global collection of systems that needed care and management for the continued survival of those systems.

All of these interdisciplinary notions of environmental dynamics encouraged British ecologist A. G. Tansley to coin the term "ecosystem" in 1935. The ecosystem concept sought to understand biological environments in their totality by including all the living organisms, and all the non-living components that interact with living

[53] Charles C. Adams, *Guide to the Study of Animal Ecology* (New York: The MacMillan Company, 1913); Gregg Mittman, *The State of Nature: Ecology, Community, and American Social Thought, 1900-1950* (Chicago: University of Chicago Press, 1992).

organisms in a particular bounded area, as functioning in an ecological system. Writing in the leading journal *Ecology,* but borrowing from physics, Tansley saw conglomerates of plants and animals as "the living nuclei of systems." But, importantly, he moved his analysis beyond Clementsian concepts that focused only on living communities. Instead, Tansley incorporated "the whole system (in the sense of physics), including not only the organism-complex, but also the whole complex of physical factors forming what we call the environment of the biome—the habitat factors in the widest sense." For later ecologists, the widest sense of this whole system extended to the whole Earth. But in 1935, Tansley's contribution was to categorize the complex biomes of an organism as "the basic units of nature on the face of the earth," which he named an ecosystem.[54]

Throughout the 1930s and 1940s, before attending the Macy Conferences on cybernetics, British ecologist at Yale, G. Evelyn Hutchinson, became increasingly intrigued by Tansley's idea of ecosystem ecology. After Tansley identified the basic units of nature in terms systems, Hutchinson sought to develop complex models and mathematics to isolate and quantify those basic units. Such a quantitative systems approach to ecology required drawing theoretical lines across nature. It placed a boundary around an ecosystem in order to better measure and calculate the diverse interactions and flows of energy within it. Yet Hutchinson recognized that Tansley's ecosystem concept could be applied, at least in theory, to the study of biological relations at any scale, up to and including the scale of Spaceship Earth. In the 1940s, as industrialized nations engaged in a global-scale war, Hutchinson sought to further

[54] Alfred Tansley, "The Use and Abuse of Vegetational Concepts and Terms," *Ecology* 16 (July

integrate his quantitative and interdisciplinary approach to ecology with other interdisciplinary systems of science.[55]

Hutchinson was already thinking in terms of interrelated systems on a planetary scale thanks to his introduction in the 1930s to the writings of Vladimir I. Vernadsky,. Vernadsky, a Russian geologist born in 1863, was a member of the Soviet Academy of Sciences until his death in 1945. Vernadsky was among the first to promote a planetary concept of the "biosphere," where inert and living matter were mutually formative and part of physico-chemical elements that shaped all of Earth's evolutionary patterns. Vernadsky saw living things as a unified planetary entity, and he argued that life functioned as Earth's primary geological force. As early as the 1920s, Vernadsky explained how life took energy from the sun, transformed it, and, in the process, redistributed the planet's inert matter. Vernadsky thus described the entire biosphere as an integrated system that could be studied systematically through a combination of quantitative analyses that he termed biogeochemistry.[56] Prolific and well respected in the Soviet Union, Vladimir Vernadsky remained little-known by Western scholars until his son, George Vernadsky who taught Russian history at Yale, introduced the elder Vernadsky's writings to fellow Yale professor, the ecologist G. Evelyn Hutchinson.

In the early 1940s, Hutchinson, with George Vernadsky's help, translated some of Vladimir Vernadsky's writing into English and published them in American

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1935): 284-306, quotes on 297 and 299.

[55] Frank Golley, *A History of the Ecosystem Concept in Ecology: More Than the Sum of the Parts* (New Haven: Yale University Press, 1994), 1-2, 47, 61.

[56] Vladimir I. Vernadsky, *The Biosphere*, English translation by David B. Langmuir, edited by Mark A. S. McMenamin (New York: Copernicus, 1998), first published in Russian in 1926.

journals. Hutchinson described Soviet geologist Vladimir Vernadsky as "one of the most remarkable scientific leaders of the present century."[57] Hutchinson was especially taken by Vernadsky's biogeochemical approach, which described Earth's biological and geological dynamics in terms of physics and chemistry. In Hutchinson's own publications, he quoted large sections from Vernadsky's global analysis of biogeochemistry, which, according to Vernadsky, sought to reduce "a precise quantitative mathematical expression of … living nature in its indissoluble connection with the external medium," or its environment. Hutchinson saw here something akin to his desire to quantify and measure the energy flows through ecosystems. He likewise sought to reduce "living nature" to, in the words of Vernadsky, the "energetical expressions of the work it does in the space of life upon our planet."[58] Perhaps, Hutchinson thought, Vernadsky's desire to quantitatively analyze the energy transfers of Earth's biogeochemical processes could best be accomplished through Tansley's ecosystem approach.

A former student of Hutchinson's named Raymond Lindeman produced the first actual proof-of-concept for ecosystem ecology, which Hutchinson pushed for publication in 1942, shortly after Lindeman's death. Lindeman had identified a Wisconsin lake as an ecosystem and studied the food-cycle relationships of both its biotic and abiotic components.[59] Lindeman identified his work as "closely allied

[57] W. I. Vernadsky, "The Biosphere and Noosphere," *American Scientist* 33:1 (January 1945): xxii, 1-12.

[58] Vernadsky quoted in G. Evelyn Hutchinson, "The Biogeochemistry of Aluminum and of Certain Related Elements," *The Quarterly Review of Biology* 18:1 (March 1943): 1-29, citing Vernadsky on 2.

[59] In ecological relations, biotic refers to living things in an environment while abotic refers to non-living chemical and physical factors that affect ecosystems.

with Vernadsky's 'biogeochemical' approach." Lindeman's study included both living and non-living matter and traced throughout the lake ecosystem the phyisco-chemical transformations of solar energy—from the sun's conversion into food by "producers," then eaten by "consumers," and broken down into basic chemical elements by "decomposers."[60]

Hutchinson, who fought the reluctant editors of *Ecology* for the posthumous publication of Lindeman's article, eventually convinced the editors that Lindeman's groundbreaking study legitimated ecosystem ecology with rigorous empiricism and quantification. In an addendum to that publication, Hutchinson celebrated how Lindeman "came to realize … that the most profitable method of analysis lay in the reduction of all the interrelated biological events to energetic terms."[61] This new focus in ecology, lamented by some, marked a shift further away from Clements's organic model of community and cooperation, and toward quantitative measurements of energy flowing throughout an ecosystem.[62]

In the period after World War II, the quantified methodologies of the ecosystem approach helped legitimate ecology as a precise and objective science, and one that embraced a systems approach that had proved so successful in advancing other fields, like cybernetics. In the eyes of Hutchinson, however, the field of ecology still remained split between two calculating foci: the systems approach for measuring energy flows, and a quantitative focus on the population

[60] Raymond L. Lindeman, "The Trophic-Dynamic Aspect of Ecology," *Ecology* 23:4 (1942): 399-417.
[61] G. E. Hutchinson, "Addendum," *Ecology* 23:4 (1942): 417.

dynamics of organisms in a particular area. For Hutchinson, the new science of cybernetics offered a theoretical synthesis for those two foci in ecology. Hutchinson's application of cybernetics for ecological thinking provided another important stepping stone in fostering what by the mid-1960s became the concept of Spaceship Earth, which combined at a global scale the technological systems of humanity with nature's ecological systems.

Cybernetic Ecosystems, or Nature as Machine

Hutchinson's ideas to synthesize ecology via the seemingly universal approach of cybernetics coalesced in October 1946 with a paper titled, "Circular Causal Systems in Ecology," which he delivered to an interdisciplinary Macy Conference on cybernetics at the New York Academy of Sciences. Hutchinson presented to this Macy Conference at the invitation of anthropologist Gregory Bateson, who knew Hutchinson from their early boyhood friendship in England. The science of interconnection, it seemed, often grew out of the personal interconnection of its scientists, particularly in Hutchinson's career. Hutchinson's paper had two sections. The first described Vernadsky's "biogeochemical approach" to ecology as a fusion of biological and physical processes that explained the global distribution of chemicals in measurable, mathematical terms. His second and more speculative section offered a "biodemographic approach" to ecology, which Hutchinson developed through equations proposed for studying animal populations. He united

[62] For a lamentation of ecosystem ecology, see Gregg Mittman, *The State of Nature: Ecology, Community, and American Social Thought, 1900-1950* (Chicago: University of Chicago Press, 1992), especially 210.

the two approaches through cybernetic feedback loops, which he called systems of circular causal paths.[63]

Hutchinson argued that groups of organisms were governed by cybernetic feedback loops, and, as a result, these groups were "self-corrected within limits." When an existing ecosystem's biogeochemical limits were surpassed, he explained, violent oscillations would reduce populations and drive some of its components to extinction. A new system, now without those lost components, would then replace the old system. In short, Hutchinson described groups of organisms as systems with feedback loops that encouraged their self-regulation and persistence. Hutchinson thus synthesized the divergence between systems ecology and population ecology through the theory of cybernetic feedback. And at the same time, he emphasized the importance of an ecosystem's biological limits. Not only did he promote a cybernetic vision of nature behaving similar to a servomechanism machine, he anticipated the environmental concern about the planetary limits to growth on Spaceship Earth.[64]

Hutchinson's Macy Conference presentation also suggested a means for controlling nature. If the components of an ecological system could be synthesized in a universal mathematical theory that also controlled machines, than an ecological system at any scale, from the local to the global, could theoretically be managed, manipulated, and controlled like a machine. According historian Peter J. Taylor,

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[63] G. Evelyn Hutchinson, "Circular Causal Systems in Ecology," *The New York Academy of Sciences* 50 (1948): 221-246; Peter J. Taylor, "Technocratic Optimism, H. T. Odum and the Partial Transformation of Ecological Metaphor after World War II," *Journal of the History of Biology* 21 (1988): 213-244.

[64] G. Evelyn Hutchinson, "Circular Causal Systems in Ecology," *The New York Academy of Sciences* 50 (1948): 221-246; Peter J. Taylor, "Technocratic Optimism, H. T. Odum and the Partial Transformation of Ecological Metaphor after World War II," *Journal of the History of Biology* 21 (1988): 213-244.

cybernetic systems thinkers like Hutchinson "conceived of nature as a machine and, at the same time, acknowledged the purposive and regulatory character of that nature-machine."[65] A cybernetic vision of ecology enabled the weaving together of living and nonliving systems such that biological relations no longer remained separate from factors governing technological systems, or for that matter, from factors governing humanity's social systems. In short, a systems approach to cybernetic ecology linked the environmental sciences to technocratic management. If properly quantified and understood through systems thinking, the control of any system seemed possible.

Throughout the 1950s, this understanding of nature as a machine morphed easily into a systems approach both for the purposeful engineering and reordering of ecological systems, and, eventually, for efforts to engineer and reorder the global interactions of politics and economic development. Science philosopher Geof Bowker explained of cybernetics discourse, which applies to the general expansion of other systems thinking, "instead of the laboratory being barricaded off from the world, the world will become a laboratory."[66] These notions, in turn, provided a primary foundation for the synthesis of ecological systems thinking that supported the concept of Spaceship Earth. System thinking even played a role in developing the technological systems involved in constructing actual spaceships. Yet, the conceptual metaphor of Spaceship Earth could never have taken flight without the spread of system thinking, especially ecosystem ecology, to wider audiences beyond

[65] Peter J. Taylor, "Technocratic Optimism, H. T. Odum and the Partial Transformation of Ecological Metaphor after World War II," *Journal of the History of Biology* 21 (1988): 221.

the veterans of wartime science and outside the interdisciplinary meetings of the Macy Conferences.

The spread of the ecosystem concept to wider audiences, and its rise to prominence within the science of ecology, owes a great deal to the work of two brothers, Howard T. Odum and his older brother Eugene P. Odum, both ecologists heavily influenced by Evelyn Hutchinson's cybernetic view of systems ecology. Throughout the 1950s and early 1960s, the popularization of ecosystem ecology in the Odum brothers' widely regarded research helped lay the groundwork the eventual popular understanding and acceptance of the Spaceship Earth metaphor in the mid-1960s. And with the Odum brothers, here too, we can trace the personal systems of interrelation back to Evelyn Hutchinson. Back in 1947, Hutchinson took the younger Howard Odum on as a graduate student, and directed him toward a biogeochemical study of the chemical element of strontium, which Howard Odum completed in 1950. By the end of that decade, as Chapter 2 explains in more detail, the movement of the radioactive isotope strontium 90 throughout ecosystems and into human bodies became an issue of worldwide concern, and also provided a key explanatory tool of ecosystem dynamics of public fearful about its radioactive dangers. However, in the early 1950s, after completing his doctoral research with Hutchinson, Howard Odum explained Hutchinson's ideas of cybernetic ecosystems to his older brother, Eugene Odum, also an ecologist. In 1953, Eugene Odum took the ideas of Hutchinson's cybernetic ecosystem in his brother's notes from graduate

[66] Geof Bowker, "How to Be Universal: Some Cybernetic Strategies, 1943-70," *Social Studies of Science* 23:1 (February 1993), 123.

school to write and publish the first book on ecology with the ecosystem as its central organizing concept.[67]

Eugene Odum's enormously influential textbook, *Fundamentals of Ecology*, expressed several ideas drawn clearly from the work of Tansley, Vernadsky, Lindeman, Hutchinson, and his younger brother Howard. Early in the book, for instance, the elder Odum defines an ecosystem in terms drawn from Hutchinson's presentation at the 1946 Macy Conference. Eugene Odum wrote that an ecological system or ecosystem was "any entity or natural unit that includes living and nonliving parts interacting to produce a stable system in which the exchange of materials between living and nonliving parts follows circular paths." Odum further described the ecosystem as "the largest functional unit in ecology, since it includes both organisms (biotic communities) and abiotic environment, each influencing the properties of the other and both necessary for maintenance of life as we have it on earth."[68] Eugene Odum also argued that Earth constituted the largest ecosystem, and that humans' social and technological systems could drastically alter that system, thereby making human interactions with complex biogeochemical cycles central to the stability and long-term survival both of existing ecosystems and human societies on Earth. For several years, Odum's textbook based on cybernetic notions of ecosystem ecology had few competitors. It was used widely, reprinted several times, revised twice, and was translated into numerous languages.[69]

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[67] H. T. Odum, "The Biogeochemistry of Strontium" (Ph.D. diss., Yale University, 1950); Eugene P. Odum, *Fundamentals of Ecology* (Philadelphia: W. B. Saunders, 1953).

[68] Eugene P. Odum, *Fundamentals of Ecology* (Philadelphia: W. B. Saunders, 1953), 9.

[69] Eugene P. Odum, *Fundamentals of Ecology* (Philadelphia: W. B. Saunders, 1953); Frank Golley, *A History of the Ecosystem Concept in Ecology: More Than the Sum of the Parts* (New

Throughout the 1950s and 1960s, the Odum brothers' teaching and writing spread Hutchinson's cybernetic ecosystem ideas, which, during that time, became the dominant paradigm in ecology. In the United States, the escalating and increasingly global Cold War spurred an influx of post-World War II government funding for scientific research, which included opportunities for ecologists to apply and test their ecosystem insights. In the mid-1950s, the Odum brothers benefited from these government expenditures in Cold War science, notably through their pioneering studies on energy-exchanges of radioactive particles through the ecosystems of thermonuclear test sites.[70] The spread of ecosystem ecology even saw it applied as a means to explain and integrate thinking on other issues, including social ones.

By the early 1960s, with growing public anxieties about environmental threats—especially from nuclear fallout as detailed in Chapter 2—ecological systems thinking became a welcome model that integrated humans and their technologies in global environmental considerations. By the mid-1960s, such conceptualizations helped promote the planetary metaphor of Spaceship Earth as a collective system of systems, including not just its ecological systems but humanity's social, political, and technological systems as well. The cybernetic notion of nature-as-machine simplified complex systems to only a few components, which, in turn, reinforced a deterministic perception of natural, social, and technological organization. The

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Haven: Yale University Press, 1994), 66-69; Donald Worster, *Nature's Economy: A History of Ecological Ideas*, Second Edition (New York: Cambridge University Press, 1994), 362-368.

[70] Eugene P. Odum and Howard T. Odum, "Trophic Structure and Productivity of a Windward Coral Reef Community on Eniwetok Atoll," *Ecological Monographs* 25 (1955): 291-320; Eugene P. Odum, "Ecology and the Atomic Age," *ASB Bulletin* 4:2 (June 1957): 1-2.

quantitative focus of ecosystem ecology thus encouraged a technocratic approach to managing both the natural environment and the human technologies acting within and upon it. Historian Debora Hammond explained that, as the impacts of human intervention into natural processes became increasingly problematic throughout the 1960s, "ecological concepts were gradually integrated into the theoretical frameworks of the social sciences. … [A]n 'ecological approach' in these fields came to mean taking into account a larger framework. In economics, for example, it meant taking into consideration social, political, psychological, and other components of human interaction."[71] During the early decades of the Cold War, the popularization of ecosystem ecology helped a generalized form of systems thinking migrate from its quantitative roots as a tool in World War II, to a conventional framework for comprehending complex and large-scale interrelationships. As a result, the concept of Spaceship Earth thus came to carry the aura of objective scientific authority, even if it was merely a political symbol that could be deployed subjectively by anyone with a global ax to grind.

Earth Science and Beyond

By the time Spaceship Earth came into use in the mid-1960s, the term "system" applied generally to the ecological, the technological, and the social. Like the new conception of Earth as an integrated biosphere, human technological

[71] Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder: University Press of Colorado, 2003), 83. See also Eugene Cittadino, "The Failed Promise of Human Ecology," in *Science and Nature: Essays in the History of the Environmental Sciences*, edited by Michael Shortland (Oxford, UK: Alden Press, 1993); as well as

systems had also become global in scope. As a metaphor, Spaceship Earth framed the problems of global industrial civilization in terms of humanity's relationship to the environment and to each other. It explored human dynamics within the biosphere and the technosphere, and it did so in terms of humanity's planetary survival. But, in the late 1950s and early 1960s, the metaphor of Spaceship Earth would never have been as potent if not for the construction of actual spaceships and the dawn of the Space Age.

Beginning in the late 1950s and running throughout the 1960s, the further spread of global systems thinking, especially with regard to technological development, occurred through new human endeavors to explore outer space. The dawn of the Space Age, the moment when humanity made its first technological leaps beyond the biosphere, traditionally dates to October 4, 1957, with the Soviet Union's launch of *Sputnik I*, the world's first human-created satellite. Immediately following the Soviet triumph, a space race ensued with fierce competition from the United States for predominance in space exploration.[72]

The U.S.-Soviet space race emerged from the Cold War rivalry between the two nations. For both competing superpowers, leadership in space advancements not only implied technological superiority, it remained closely tied to national security interests due to rocketry's destabilizing threat of nuclear-armed ballistic missiles. Equally important, however, supremacy in space also symbolized for the

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Geoffrey Vickers's foreword to F.E. Emery and E.L. Trist, *Towards a Social Ecology: Contextual Appreciation of the Future in the Present* (New York: Plenum Press, 1972), vi.

[72] For an exciting popular portrayal of the U.S.-Soviet space rivalry, see Deborah Cadbury, *Space Race: The Epic Battle between America and the Soviet Union for Domination of Space* (New York: Harper Perennial, 2007).

superpowers a sense of ideological superiority. Both for policy-makers and a planetary public often caught in the crosshairs of global Cold War conflicts, domination of space suggested which system of social, political, and industrial economic modernization—Soviet communism or American capitalism—deserved global dominance and should earn emulation by the new nations born amid post-World War II decolonization.[73] And, as an upshot, launching the Space Age and running the space race not only blasted humankind beyond Earth's boundaries, it inspired a new understanding of the systems supporting life back on Earth.

The launch of *Sputnik I* and the ensuing space race has, in popular media coverage, nearly eclipsed the extensive activities of global scientific investigation and international cooperation during the International Geophysical Year (IGY), out of which the Space Age emerged. The IGY, which ran from July 1957 to December 1958, was modeled on prior scientific inquiries of Earth's poles during the International Polar Years of 1882-1883 and 1932-1933. The IGY expanded drastically those polar expeditions by including the entire planet within its scientific purview.[74] Lloyd V. Berkner, an American physicist, proposed the IGY back in 1950

[73] For an exceptional analysis of Cold War conflict as a world-scale battle between opposing systems of modernity as well as for the hearts and minds of Third World nations, see Odd Arne Westad, *The Global Cold War: Third World Interventions and the Making of Our Times* (Cambridge: Cambridge University Press, 2007), especially pp. 1-72.

[74] Roger D. Launius, James Rodger Fleming, and David H. Devorkin, "Rise of Global Scientific Inquiry in the International Polar and Geophysical Years," and Roger D. Launius, "Toward the Poles: A Historiography of Scientific Exploration during the International Polar Years and the International Geophysical Year," in *Globalizing Polar Science: Reconsidering the International Polar and Geophysical Years*, edited by Roger D. Launius, James Rodger Fleming, and David H. Devorkin (New York: Palgrave Macmillan, 2010), 1-9, 47-81. Sophisticated historical accounts of the IGY include Fae L. Korsmo, "Shaping Up Planet Earth: The International Geophysical Year (1957-1958) and Communicating Science through Print and Film Media," *Science Communication* 26:2 (2004): 162-187. For contemporary accounts, see Sydney Chapman, *IGY: Year of Discovery, The Story of the International Geophysical Year* (Ann Arbor: University of Michigan Press, 1959); Walter Sullivan, *Assault on the Unknown: The International Geophysical Year* (new York: McGraw-Hill, 1961).

as a means to gather planetary scientific data, supposedly in the name of science as a peaceful and transnational search for universal knowledge. However, as an ardent Cold Warrior, Berkner's covert purpose remained gathering global environmental data as a tool for American science to better wage the Cold War.[75] When he first promoted the IGY publically in 1954, he masked its backdrop of Cold War militarism. Instead, he described the IGY's goals in the rhetoric of scientific internationalism. In 1954, with UN forces still nursing wounds from the Korean War and with Cold War concerns having become thermonuclear, Berkner declared that, "Tired of war and dissension, men of all nations have turned to 'Mother Earth' for a common effort on which all find it easy to agree."[76] Envisioned in such a way, the IGY's increase of environmental knowledge would, ideally, also help foster global social cohesion and understanding. The Mother Earth of the IGY eventually evolved into the Spaceship Earth of the 1960s, thanks in part to the IGY's promotion of geoscience as a tool to better understand and manipulate Earth's dynamic forces, as well as its role in launching the Space Age.

The IGY's diverse activities were organized by the International Council of Scientific Unions, a non-governmental collective of national scientific bodies and transnational scientific associations that—no surprise—Lloyd V. Berkner headed between 1957 and 1959. The coordination effort involved more than 4,000 research stations worldwide, either already operating or created as part of the IGY, some of which helped identify how humanity's technological and industrial systems

[75] Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (New York: Oxford University Press, 2013), 89-94.

negatively impacted the ecological systems of Spaceship Earth. For instance, a new research project created as part of the IGY included establishment of the Mauna Loa Observatory in Hawaii: the first program featuring continuous measurement of atmospheric carbon dioxide concentrations. As part of the IGY, the inquiry into the need to measure atmospheric carbon content at a global scale encouraged nuclear physicist, Hans Suess, and Roger Revelle, then head of the Scripps Institute of Oceanography, to declare in 1957 that, "Through his worldwide industrialized civilization, man is unwittingly conducting a vast geophysical experiment on the Earth's climate."[77] The systems thinking and the construction of technological systems that accompanied the IGY intersected with and contributed to the growing consciousness of the global environment, which in turn inspired reconsideration of humanity's influence over those planetary systems.

Even though much IGY activity concentrated on Earth's polar regions, including the permanent occupation of Antarctica as a peaceful science reserve, the IGY's international investigations yielded interdisciplinary data from across the globe. Important results from the IGY involved appraisal of upper atmospheric winds, measurements of Earth's magnetic field, discovery (and subsequently the covert nuclear explosion by American scientists) of the Van Allen radiation belts, charting ocean currents and depths, and discovery of the mid-Atlantic ridges, which

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[76] Lloyd V. Berkner, "International Scientific Action: The International Geophysical Year 1957-1958," *Science* 119 (April, 30 1954): 569-575, quote from 575.

[77] R. Revelle and H. E. Suess. "Carban Dioxide Exchange between the Atmosphere and Ocean and the Question of an Increase of Atmospheric CO2 during the Past Decades," *Tellus* 9 (1957): 19. See also Charles D. Keeling, "The Influence of Mauna Loa Observatory on the Development of Atmospheric CO2 Research," in *Mauna Loa Observatory: A 20th Anniversary Report* (National Oceanic and Atmospheric Administration Special Report, September 1978), edited by John Miller (Boulder, CO: NOAA Environmental Research Laboratories), 36-54.

helped substantiate the theories of plate tectonics that undergird modern geology.[78] Collectively, these scientific investigations further enabled the comprehension of Earth as an integrated system of biogeochemical systems. In short, the IGY helped advance both the objective and conceptual realization of Spaceship Earth as an integrated system of global systems.

The IGY also promoted disciplining Earth's systems for greater control of those systems. This deeper scientific understanding of Earth's natural systems was made possible by the development of new scientific and technological systems, not unlike the initial development of cybernetics from servomechanism designs. The most dramatic technological events planned as part of the IGY were the launches of *Sputniks I* and *II* in October and November 1957, and the American response with the launch of its first satellite, *Explorer I*, in January 1958. Here again, we see another manifestation of post-war systems thinking operating at a planetary scale. As a whole, the scientific discoveries and technological accomplishments of the IGY contributed substantially to a new understanding of the natural systems that comprised Spaceship Earth and to the emergence of a truly global scale for geoscience.

The physical geosciences or earth sciences were among the privileged fields during the Cold War to receive incredible investment from the governments of

[78] Roger D. Launius, "Toward the Poles: A Historiography of Scientific Exploration during the International Polar Years and the International Geophysical Year," in *Globalizing Polar Science: Reconsidering the International Polar and Geophysical Years*, edited by Roger D. Launius, James Rodger Fleming, and David H. Devorkin (New York: Palgrave Macmillan, 2010), 66-69. For details on the United States conducting atomic tests in the newly discovered Van Allen radiation belts, see Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (New York: Oxford University Press, 2013), 122-123; James Rodger Fleming, *Fixing the Sky: The*

United States, the Soviet Union, and their respective allies. According to historian Spencer Weart, the Cold War's potential for armed conflict anywhere on the globe inspired military commanders' realization that "they needed to understand almost everything about the environments in which they operated, from the ocean depths to the top of the atmosphere."[79] As a result, IGY's production of knowledge in the earth sciences was embedded equally in transnational scientific organizations and competing national interests. Historian Allen A. Needell explained how successes during the IGY and later strides in space exploration bolstered scientific and technical intelligence, while simultaneously serving as "a vehicle of foreign policy, [and] as a means of providing certain information required by the military."[80] Massive investments for the nuclear arms race and the associated space race led to construction of vast technological systems that simultaneously threatened humanity's thermonuclear destruction and enabled humans to explore outer space.[81] Investments for space exploration accelerated after U.S. President John F. Kennedy declared to Congress in May 1961 his goal of sending a manned mission to the moon and back before the end of the 1960s.[82] Part of the initial impetus for the space

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Checkered History of Weather and Climate Control (New York: Columbia University Press, 2010), 209-210.

[79] Spencer R. Weart, *The Discovery of Global Warming* (Cambridge, MA: Harvard University Press, 2008), 21.

[80] Allan A. Needell, *Science, Cold War, and the American State: Lloyd V. Berkner and the Balance of Professional Ideals* (Amsterdam: Harwood Academic Publishers, 2000), 317. Needell's study of Berkner's career invoked the simultaneity of supposedly apolitical scientific internationalism occurring alongside the advancement of science to bolster nationalism and security interests.

[81] Thomas P. Hughes, *Human-Built World: How to Think about Technology and Culture* (Chicago: University of Chicago Press, 2004), 77-82.

[82] John F. Kennedy, "Special Message to the Congress on Urgent National Needs," May 25, 1961, http://www.presidency.ucsb.edu/ws/?pid=8151, accessed March 6, 2014. See also John F. Kennedy, "Address at Rice University, Houston, Texas," September 12, 1962, John F. Kennedy Presidential Library and Museum, accessed October 10, 2013, http://www.jfklibrary.org/Asset-Viewer/Archives/JFKPOF-040-001.aspx.

program may well have been to secure international prestige. But the Cold War investments in nuclear capability, aerospace, and earth science also produced unprecedented tools for understanding the Earth as a unified system.

Ironically, the technological advancements for better understanding how to destroy the enemy in World War II and in the Cold War produced a new image of the planet and new ways of understanding the complex relationships on it. "Amidst the materiality of destruction," explained historian of science Michael Dennis, "came the possibility of reconfiguring our understanding of our own planet."[83] As Dennis argued, the production of scientific knowledge was sometimes accompanied by new social relations. Through the IGY, and in the space race it helped launch, knowledge and social order were intertwined in a process of co-production that helped propagate the new social, political, technological and ecological conception of Spaceship Earth. Additionally, the communications technologies that systems thinking enabled, especially via artificial satellites, contributed to the sense that Earth was a single system with increasing interconnection. Systems thinking provided the foundation on which Spaceship Earth was built. Yet, along with the success of systems thinking in detail-oriented fields like astrophysics, engineering, and earth sciences, a still-academic but more generalized form of systems thinking sought to further unify the different disciplines.

[83] Michael Dennis, "Earthly Matters: On the Cold War and Earth Sciences," *Social Studies of Science* 33:5 (October 2003): 809-819, quotes on 817.

The Skeleton of Science

The interdisciplinary academic approach known as General Systems Theory also emerged during the post-war decades and flourished throughout the 1960s. It offered yet another example of systems thinking's dispersion, which helped further lay the conceptual foundation for the concept of Spaceship Earth. In 1956, at the annual meeting of the American Society for the Advancement of Science (AAAS), the world's largest general scientific society, anthropologist Margaret Mead joined idiosyncratic economist Kenneth Boulding as a founding member of a new interdisciplinary organization called the Society for General Systems Research (SGSR).[84] Back in 1942, Mead had became intellectually entranced when she heard Arturo Rosenblueth first present an early outline on cybernetic feedback controls that he, Julian Bigelow, and Norbert Weiner developed while constructing servomechanisms. Mead found herself so engrossed by a scientific theory "precise enough to be used in problem solving, but abstract enough to cross disciplinary boundaries," that she did not notice she had broken her own tooth during the presentation until after it concluded.[85] As a regular attendee to the Macy Conferences over the next decade, Mead pursued cybernetics' cross-disciplinary applications to social sciences. With the creation of the SGSR in 1956, she found another group of scholars interested in the ability of systems thinking to integrate disciplines and offer new insights. Co-founder Kenneth Boulding, a British-born economist then at the

[84] Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder: University Press of Colorado, 2003), 248. The SGSR continued meeting at annual AAAS meetings until the early 1980s.

[85] Thomas P. Hughes, *Human-Built World: How to Think about Technology and Culture* (Chicago: University of Chicago Press, 2004), 93.

University of Michigan, also found the general systems approach an apt means of integrating and understanding complexity.

According to Kenneth Boulding, first president of the SGSR, the objective of General Systems Theory was, as its name implied, to highlight general similarities in the theoretical constructions of different disciplines, and to develop theoretical models that applied generally to a variety of those different disciplines. In short, General Systems Theory applied a systems framework to all disciplines as a means to unify and make relatable their underlying ideas. For SGSR members, General Systems Theory offered an adaptable theoretical framework that focused on the interrelationships between the parts of a system, as well as the relations between systems and their encompassing environments. This general view of systems thinking, while still scientific, represented a significant departure from the reductionist approach of traditional science.[86]

Traditional science often understood and observed the natural world by fragmenting it into its smallest components and reducing knowledge into the specialization of specific disciplines, often with little interaction between the fragments. While appreciating the importance and detailed advances made available by such specialized knowledge, advocates of General Systems Theory, like Kenneth Boulding, sought to develop generalized yet applicable frameworks for synthesizing different fields of knowledge. Boulding was a life-long pacifist, an expert on conflict resolution and peace, and a nonconformist economist who rebelled against a narrow focus on commodities and gross domestic product in traditional economics. His view

on economics expanded to include not just the value of goods, but wider measures that included the social and psychological roots of human value. He claimed "there is no such thing as economics, only social science applied to economic problems."[87] In 1956, Boulding described General Systems Theory as the "skeleton of science" because it aimed "to provide a framework or structure of systems on which to hang the flesh and blood of particular disciplines and particular subject matters in an orderly and coherent corpus of knowledge." At its most ambitious, Boulding hoped General Systems Theory could "develop something like a 'spectrum' of theories—a system of systems."[88]

Throughout the late 1950s and 1960s, the popularity of General Systems Theory grew, ironically, in tandem with the spread of systems thinking into specific disciplines. In 1957, the SGSR had only 147 members. But, by the mid-1960s, with the explosion of systems thinking into a host of ventures—from computer science to business management, from cybernetics to civil governance, and from ecosystem ecology to the construction and launching of spaceships—SGSR membership grew by a factor of ten to around 1000. The society's most distinguishing characteristic was likely its ability to unite for meaningful discourse such a diverse collection of scholars, researchers, and practitioners. Members came from a broad spectrum of academic disciplines: mathematics, electrical engineering, administrative theory,

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[86] Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder: University Press of Colorado, 2003), 9-11.

[87] Boulding quoted in Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder: University Press of Colorado, 2003), 198.

[88] Kenneth E. Boulding, "General Systems Theory: The Skeleton of Science," *Management Science* 2:3 (April 1956): 197-208, reprinted in Kenneth E. Boulding, *Beyond Economics: Essays on Society, Religion, and Ethics* (Ann Arbor: The University of Michigan Pres, 1968), 83-97, quotes on 96 and 84.

biophysics, ecology, psychiatry, psychology, economics, sociology, history, and philosophy of science.[89]

By the mid-1960s, several academic programs in systems research had been established in close association with SGSR, including the Systems Science Institute at the University of Louisville in Kentucky; the Department of Systems Science at the State University of New York in Birmingham; the Cybernetics Systems Program at San Jose State University in California; the Social Systems Science Program at the University of Pennsylvania; the Institute for Advances Systems Studies at California State Polytechnic University; the Systems Science Program at Portland State University in Oregon; the Whole Systems Design Program at the University of Antioch in Seattle, Washington; and the Saybrook Institute in San Francisco, California.[90] These programs reflect the institutionalization of systems thinking into academia, all of which promoted the unity of knowledge over its dislocation into different disciplinary silos. Seeking the theoretical unity of knowledge provided the bedrock for the discourse on the social, political, and ecological unity embodied by the symbol of Spaceship Earth.

By the 1960s, systems thinking became for many in and out of the academy not only the skeleton of science, but an amorphous framework for understanding the interactions and complexity of all reality. Ludwig von Bertalanffy, an Austrian-born theoretical biologist, agreed. In the late 1940s, Bertalanffy had developed a model of living organisms as open systems that maintains themselves in steady states of

[89] Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder: University Press of Colorado, 2003), 249-251.

enduring imbalance via constant interaction with their surrounding environments. His open systems perspective emphasized interactive relationships rather than mechanistic reductionism, and it helped lay the groundwork for what became General Systems Theory. By 1967, Bertalanffy could confidently declare that, "If someone were to analyze current notions and fashionable catchwords, he would find 'systems' high on the list." The concept of systems thinking, he announced, had "pervaded all fields of science and penetrated into popular thinking, jargon, and mass media."[91] As part and parcel of the discourse about Spaceship Earth and a key conceptual grounding for the global environmental moment, a general application of thinking in terms of systems had, by the 1960s, become a commonplace approach to understanding reality, both in and outside significant sections of academia. The approach even found application for solving problems in the realms of industry and civil society.

Social and Industrial Dynamics

Increasingly, a variety of professionals influenced by the technological and theoretical successes of systems scientists conceptualized the world around them in terms of systems. Where these actors may have once seen an airplane in isolation, they now conceived it as part of a larger system that involved airfields, fuel depots, maintenance facilities, air-traffic controllers, pilots, and passengers, to say nothing of

[90] Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder: University Press of Colorado, 2003), 251.

[91] Bertalanffy cited in Lisa Chong and L. Bryan Ray, "Whole-istic Biology," *Science* 295 (March 1, 2002): 1661; see also, Preface in Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder, CO: University of Colorado Press, 2003), xiii.

the systems of research and production that went into constructing the airplane's technologies. This systems view of the world developed into a variety of systems-based techniques for managing social and technological systems, including further advancements in quantitative operations research, systems engineering design, and systems analysis, which compared, contrasted, and evaluated project proposals through intricate cost-benefit determinations.[92] By the early 1960s, the systems approach, in its multifarious forms of management and control, had expanded far beyond the military realms of war-planning, nuclear war research, and aerospace engineering. Many of the tens of thousands of the scientists, engineers, and project managers who helped construct and manage Cold War weapons systems and aerospace systems took their learning experiences on the systems approach and applied them to other projects. Not just confined to the United States and Great Britain, the systems approach also spread abroad to other industrialized allies, notably to France and Sweden.[93]

Additionally, the development of digital computers from the technological application of cybernetics fostered the integration of information processing and coordination of scheduling through the digitized systems techniques of feedback and response. Despite the bulk of early computers, by the early 1960s, these computer-enabled techniques nonetheless became essential to diverse users: first, in designing

[92] Thomas P. Hughes, *Human-Built World: How to Think about Technology and Culture* (Chicago: University of Chicago Press, 2004), 82-83.

[93] See, Gabriell Hecht, "Planning a Technological Nation: Systems Thinking and the Politics of National Identity in Postwar France," pp. 133-160, and Arne Kaijser and Joar Tiberg, "From Operations Research to Future Studies: The Establishment, Diffusion, and Transformation of the Systems Approach in Sweden, 1945-1980," pp. 385-412, both in Agatha C. Hughes and Thomas P. Hughes, *Systems Experts and Computers: The Systems Approach in Management and Engineering, World War II and After* (Cambridge, MA: MIT Press, 2000).

and implementing the military's complex air and intercontinental ballistic missile defense systems, but also in the development of meteorology and climatology. As historian Paul N. Edwards argued, computers and military systems of nuclear defense co-evolved to help shape a systems discourse that spread during the Cold War—a discourse that came to see battlefields, the world, and, eventually, human culture itself all as multi-layered, closed systems able to be managed and controlled.[94] The advance of technical systems and the spread of global systems thinking into the thought and culture of society during the 1950s and 1960s reflected the profound adaptability and growing ubiquity to the systems approach.

Advocates of the systems approach at influential organizations in the United States and in several of its leading universities, especially at MIT, developed and applied systems methods to managerial techniques for civil government and industry. For instance, the RAND Corporation in Santa Monica, California initially adapted quantified methods of operations research for defense planning against nuclear attacks. But, by the mid-1950s, RAND codified and rationalized a suite of systems techniques on the premise that systems thinking offered a rational response for control of growing societal complexity. RAND soon earned hefty research contracts that allowed them to straddle the borders between academia, industry, and military defense.[95]

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[94] Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996). For Edwards's analysis of the role of computers in the history of weather prediction and climate science, see Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (Cambridge, MA: MIT Press, 2010).

[95] Thomas P. Hughes, *Human-Built World: How to Think about Technology and Culture* (Chicago: University of Chicago Press, 2004), 83; Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996), 116. See the

Systems approaches also offered opportunities to maximize efficiency and profit for large corporations and industrial producers. For example, after helping pioneer the development of digital computing for the U.S. military in the 1950s, systems scientist Jay Forrester joined MIT's Sloan School of Management to apply scientific systems approaches to business management. Forrester analyzed cyclical changes in the relationships between factory production and employment. In 1958, he argued that a company should be viewed "not as a collection of separate functions but as a system in which the flows of information, materials, manpower, capital equipment, and money set up forces that determine the basic tendencies toward growth, fluctuation, and decline." By the early 1960s, Forrester developed this systems approach into a model-based theory he called "industrial dynamics."[96] Industry, economic development, and society all became interlinked through a systems framework.

Almost simultaneously, as the systems approach found increased use in industrial, social, and ecological analysis, and even in the construction of spacecraft, systems thinking also spread into urban planning and corporate management. Systems scientists, aerospace engineers, and defense intellectuals alike opportunistically migrated from the war room to the boardroom, or from the research laboratory to the halls of city government. For example, at MIT, Jay Forrester,

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early development of RAND, see Martin J. Collins, *Cold War Laboratory: Rand, the Air Force, and the American State, 1945-1950* (Washington, DC: Smithsonian Institution Press, 2002).

[96] Forrester cited in Paul N. Edwards, "The World in a Machine: Origins and Impacts of Early Computerized Global Systems Models," in Agatha C. Hughes and Thomas P. Hughes, eds., *Systems, Experts, and Computers: The Systems Approach in Management and Engineering, World War II and After* (Cambridge, MA: MIT Press, 2000), 236. See Jay Forrester, *Industrial Dynamics* (Cambridge, MA: MIT Press, 1961).

expanded his systems approach of industrial dynamics in attempts to model all the complex interactions of entire cities, which he called "urban dynamics."[97] In the mid-1960s, the pressing problems of housing, infrastructure, and unemployment in American cities led systems advocates to bundle systems approaches and apply them in America's Great Society programs.[98]

According to historian Walter A. McDougal, the application of technocratic systems techniques in the late 1950s and 1960s created an "alliance of military hawks and social activists … [who both] endorsed federal action on the principle that the state could best foster new knowledge, power, and economic growth through planned management."[99] The odd alliance of civil and military systems advocates took methods for fighting the Cold War and applied them to the War on Poverty, seizing vast sums of federal, state, and city government largess in the process. For example, in 1966, California and other state governments spent about $11 million on systems analysis studies, with New York State alone expending $4 million. That same year, seventeen cities and regional authorities spent a similar amount on systems analysis contracts, with Baltimore and Philadelphia each appropriating more than $2 million.[100]

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[97] Jay Forrester, *Urban Dynamics* (Cambridge, MA: MIT Press, 1969). See Chapter 5 for the evolution of Forrester's systems modeling as it later applied to the global environment.

[98] David R. Jardini, "Out of the Blue Yonder: The Transfer of Systems Thinking from the Pentagon to the Great Society, 1961-1965," in Agatha C. Hughes and Thomas P. Hughes, *Systems Experts and Computers: The Systems Approach in Management and Engineering, World War II and After* (Cambridge, MA: MIT Press, 2000); Jennifer S. Light, *From Warfare to Welfare: Defense Intellectuals and Urban Problems in Cold War America* (Baltimore: Johns Hopkins University Press, 2004); Marvin Berkowitz, *The Conversion of Military-Oriented Research and Development to Civilian Uses* (New York: Praeger, 1970).

[99] Walter A. McDougal, *...The Heavens and the Earth: A Political History of the Space Age* (Baltimore: John Hopkins University Press, 1985), 403.

[100] Thomas P. Hughes, *Rescuing Prometheus* (New York: Pantheon Books, 1998), 187.

Sociologist Robert Lilienfeld argued that the extension of systems thinking to social applications in the 1960s worked unintentionally but effectively to justify claims to power and prestige by society's technocratic elite. As a result, Lilienfeld and other critics identified systems thinking as the ideology of highly rationalized, technological, and institutional bureaucracies of power.[101] Yet, detached from its scientific basis in quantified analysis—or, at best, loosely connected to the authority of systems science as a means to comprehend all reality—systems thinking by the end of the 1960s also provided a common language for the disempowered to demand changes to global economic systems; for grassroots activists and students to rebel against oppressive social and political systems; and for environmental advocates to warn that Spaceship Earth was headed toward ecological collapse unless the worldwide reach of humanity's economic, social and geopolitical systems were soon revised. The evolution of systems thinking into all of these realms thus helped make the global environmental moment possible.

Seeing Global Systems

Systems thinking synthesized new scientific approaches to understanding complex relations. It also served as a guide for constructing the complex technologies of the Cold War—from the physical and conceptual developments accompanying the design and manufacture of weapons systems for nuclear

[101] Robert Lilienfeld, *The Rise of Systems Theory: An Ideological Analysis* (New York: Wiley, 1978); Ida Hoos, *Systems Analysis in Public Policy: A Critique* (Berkeley: University of California Press, 1972); Peter Taylor, "Technocratic Optimism, H. T. Odum, and the Partial Transformation of Ecological Metaphor After World War II," *Journal of the History of Biology* 21:2 (Summer 1988),: 213-244.

deterrence and attack, to the creation of actual spaceships that, for the first time, sent representatives of Earth's life forms beyond the biosphere on which all life depended. The surge in systems thinking in post-World War II sciences, from ecology to economics, and its spread as a general tool for conceiving complex and global interrelations, provided a conceptual model that identified Earth's biosphere as inherently interconnected with humanity's technosphere and with what some economists called its econosphere.[102]

Bolstered by the authority of science, post-war systems thinking was thus a primary factor in producing the global environmental moment that culminated in Stockholm's collection of conferences on the global environmental crisis. By the mid-1960s, the systems approach had migrated from the quantified realms of Operations Research and cybernetics for waging global warfare, and from the biogeochemical processes that informed ecology and the earth sciences, to the technologies that would send spaceships to the moon. After widespread use as a tool for military planners, technocratic engineers, and even for managers of industrial and civil bureaucracies, the methods of scientific systems thinking evolved into a more generalized and philosophical lens that seemed applicable to almost any circumstance. This more philosophical lens of systems thinking saw nearly all aspects of the world as parts of a holistic, dynamic, and interdependent system of systems. Importantly, systems advocates saw systems at all scales, from the local to

[102] See the end of Chapter 2 for more on human interconnection within the econosphere, as mentioned in Kenneth E. Boulding, "The Economics of the Coming Spaceship Earth," in *Environmental Quality in a Growing Economy, Essays from the Sixth RFF Forum*, edited by Henry Jarrett (Baltimore: Johns Hopkins University Press for Resources for the Future, Inc., 1966), 3-14.

the global, as things to be managed for improvement.[103] Systems, it seemed, were everywhere and everything. Systems thinking thus provided an essential epistemology for framing reality on Spaceship Earth.

In 1965, when Adlai Stevenson delivered his final address to a global audience in the UN ECOSOC council, he described Earth as a "fragile craft" and "little spaceship" that humanity needed to love better in order to survive their shared voyage into the unknown future. Consciously or not, Stevenson drew upon a deeper history of systems thinking that blossomed during World War II and proliferated into a variety of scientific disciplines and bureaucratic institutions. By invoking this ideology of integration in the UN, Stevenson helped spread a new metaphor for understanding the interconnection of the planet's ecological and human systems, which soon came to be called Spaceship Earth. Yet, even in the years before spaceships brought back the first powerful photographs of an Earthrise, the evolution of systems thinking had already encouraged a new vantage point from which humans could conceive of the Earth as a whole system.[104]

Seeing the world in terms of integrated systems helped lay a foundation for fostering the global environmental moment. The Spaceship Earth metaphor that Adlai Stevenson helped shepherd into popular and political consciousness signaled a new way of thinking about the consequences of science and technology, the

[103] Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder, CO: University Press of Colorado, 2003); Robert Lilienfeld, *The Rise of Systems Theory: An Ideological Analysis* (New York: John Wiley & Sons, 1978).

[104] Robert Poole, *Earthrise: How Man First Saw the Earth* (New Haven, CT: Yale University Press, 2008); Neil Maher, "Shooting the Moon," *Environmental History* 9:3 (2004): 526-531; Denis Cosgrove, "Contested Global Visions: One-World, Whole-Earth, and the Apollo Space Photographs," *Annals of the Association of American Geographers* 84:2 (June 1994): 270-294.

functions of international politics, the mechanics of the global economy, and the fate of human survival on our increasingly interconnected planet. At the same time, another necessary contributor to the global environmental moment was the threat that humanity's powerful technological and industrial systems threatened the ecological collapse of Earth's interdependent systems. Chapter 2 explains how seeing systems and thinking globally intersected with growing realizations about humanity's environmental incursions on a worldwide scale, initially through the spread globally of radioactive fallout from thermonuclear atomic testing.

Chapter 2

SYSTEMS FAILURE:
Fallout and Eco-Catastrophe on Spaceship Earth

Yet the first bringer of unwelcome news
Hath but a losing office, and his tongue
Sounds ever after as a sullen bell …
— William Shakespeare, Henry IV, part II.

"Man is finally going to have to face the fact that he is a biological system living in an ecological system, and that his survival power is going to depend on his developing symbiotic relationships of a closed-cycle character with all the other elements and populations of the world of ecological systems."
— Kenneth E. Boulding, "Earth as a Spaceship," 1965.

While the last chapter presented a history of the conceptual and scientific framing for "seeing" global systems—as represented by the symbol of Spaceship Earth—this chapter addresses how various experts raised alarms about ways that new human actions and technologies threatened both the environmental stability Spaceship Earth and humanity's survival on it. Warnings about the spread of environmental dangers across all of Spaceship Earth provided the necessary kindling for igniting the global environmental moment. In an age threatened by possible nuclear holocaust, planetary ecological disruption, vast disparities in wealth, and political turmoil amid sweeping social change, the symbol of Spaceship Earth increasingly implied a growing concern that the global systems on which life depended faced potential collapse from human activities, like the explosion of atomic bombs in the open atmosphere, the exponential growth of industrial pollution, and the expansive application of toxic chemicals throughout Earth interconnected ecosystems. For scientists and political actors to summon the symbol of Spaceship

Earth not only signified global interconnection, it suggested the precariousness of a planetary ecosystem exposed to human intervention.

From the 1940s through the 1960s, the reconfiguration of Earth in terms of whole systems—through cybernetics, through the ecosystem concept, through Vernadsky's notion of a planetary biosphere, and through the space-age icon of Spaceship Earth—seemed to offer a means for integrating humans and their social systems into the planet's natural history of evolution. Yet humanity, which had obviously evolved inside the biosphere along with all other living matter, also seemed to operate outside Earth's natural evolutionary forces. Reproducing the power of stars in atomic explosions and blasting rockets, satellites, and astronauts beyond the biosphere proved that human animals, who were of the Earth, could create technologies that seemed somehow outside of nature, beyond its limits. Clearly humans were capable, whether consciously or unconsciously, of altering the face of the planet in ways that might suit their needs and desires, but also in ways that could threaten the endurance of ecosystems on which their survival depended.

Back in 1935, early ecosystem ecologist Alfred Tansley had wrestled with the place of humanity in nature. "It is obvious," Tansley wrote, "that modern civilized man upsets the 'natural' ecosystems … on a very large scale." However, he continued, "it would be difficult, not to say impossible, to draw a natural line between the activities of the human tribes which presumably fitted into and formed parts of 'biotic communities' and the destructive human activities of the modern world. Is man part of 'nature' or not? Can his existence be harmonized with the conceptions of the 'complex organism'?" For his part, Tansley concluded that

humankind's role remained mixed, so that human activity found its proper place in nature "as an exceptionally powerful biotic factor which increasingly upsets the equilibrium of preexisting ecosystems and eventually destroys them, at the same time forming new ones of very different nature."[105] Similarly, the whole-system framework of Spaceship Earth offered a way to identify humans as part of nature, responding to their environment in various ways, including construction of ecologically disruptive technological, social, and political systems, all with a purpose toward improving the basic conditions of survival.

Yet, as this chapter explains, in the late 1950s and into the 1960s—with the spread of world-scale systems thinking in science, technology, and civil application, with the threat of world-scale apocalypse from thermonuclear war, and with growing awareness of humanity's disruptive impact on natural environments—more voices in the academy, in politics, and across broad publics wondered whether humanity's increasingly affective existence could be harmonized with the organic Earth. Throughout the early decades of the Cold War, the increasing scope of human technologies and the scale on which they affected the biosphere seemed to threaten the conditions of survival. One scholar on whole-Earth systems thinking noted that, "In the age of nuclear weapons and other global technologies, massive power and communications networks, and complex world-wide economic relations, the implications of system failure were unprecedented in their potential for disaster."[106]

[105] Alfred G. Tansley, "The Use and Abuse of Vegetational Concepts and Terms," *Ecology* 16 (July 1935): 284-306, here 303.

[106] William Harold Bryant, "Whole System, Whole Earth: The Convergence of Technology and Ecology in Twentieth-Century American Culture," (Ph.D. diss., University of Iowa, 2006), 63. See

The question then became, not whether humans were or were not a part of nature, but whether the human-influenced, global-scale, techno-ecological systems on Earth were moving toward planetary collapse, and, if so, how those systems should be re-adjusted to ensure survival.

This chapter reveals how several biological and environmental scientists, along with some leading economists—mostly from the United States, but all from the industrialized global North—sounded various environmental alarms about the future sanctity of Spaceship Earth. Politically concerned scientists and activists like Linus Pauling, Rachel Carson, Barry Commoner, Paul Ehrlich, and other experts like economists Kenneth Boulding and Barbara Ward argued that humanity's failure to recognize and protect the systems of environmental interconnections on Spaceship Earth were leading to planetary-scale eco-catastrophes. They warned about the planet's poisoning from the products of war and industry, from synthetic chemicals, from surging human populations and their economic exploitation of Earth's finite resources. From the mid-1950s throughout the 1960s, fears about nuclear fallout, and its newly realized spread across vast continental and oceanic distances, stood out as the foremost concern about the global environment. Building from fears about global nuclear fallout and deadly radioactive particles in children's bones, the various environmental warnings by scientists evolved in the 1960s to include threats about future silent springs from the spraying of hazardous pesticides, as well as prophesies of massive famines and human die-off from overpopulation.

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also Chris H. Lewis, "Progress and Apocalypse: Science and the End of Modern World (Ph.D. diss., University of Minnesota, 1991).

Collectively, these concerns about humanity's unchecked devastation of an interdependent Spaceship Earth inspired the global environmental moment—a time that witnessed the rise of a new environmental consciousness that began in the industrialized world and quickly spread globally, to culminate in a cacophony of popular and political responses in Stockholm, where national governments, civil society, and leading scientists clashed over the best means for solving global environmental challenges. The global environmental threats explained in this chapter provided a primary impetus for the international action in the global environmental moment addressed in ensuing chapters. This chapter begins with realizations about the dangers of radioactive fallout from nuclear explosions, and their surprising spread around the planet through Earth's biogeochemical pathways.

The Atomic Age and the Age of Ecology

Increasingly, environmental scholars emphasize the Cold War's pivotal contributions to the growth of environmental thought in the twentieth century. Similarly, foreign relations scholars increasingly integrate the rise of environmentalism and the vast scale of environmental change due to the Cold War into their narratives.[107] This shared focus on Cold War exigencies has helped expand and better integrate explanations for the rapid rise of the post-World War II era's

[107] See the chapters in J.R. McNeill and Corinna R. Unger, eds., *Environmental Histories of the Cold War* (Washington, DC: German Historical Institute/New York: Cambridge University Press, 2010), as well as other works by contributing authors, especially Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (New York: Oxford University Press, 2013). See also, Kurk Dorsey, "Bernath Lecture – Dealing with the Dinosaur (and Its Swamp): Putting the Environment in Diplomatic History," *Diplomatic History* 29:4 (September 2005), 573-587; Mark Lytle, "An Environmental Approach to American Diplomatic History," *Diplomatic History* 20:2 (Spring 1996): 279–300.

new ecological consciousness beyond the traditional instigators of postwar affluence, distaste over pollution, countercultural protest, and shifts in political liberalism.[108] For example, the massive funding of science during the Cold War enabled the vast expansion of expert knowledge about the Earth and its interconnected biogeochemical systems. Yet, as noted by J.R. McNeill and Corinna R. Unger, "by conferring on scientists a special position within society," the Cold War dialectically produced "its own, severest critics."[109] For the lay public, however, the greatest Cold-War instigator of modern environmentalism was, without question, the military tool most associated with the Cold War: nuclear weapons.

Exploding nuclear devices in the open atmosphere, and the radioactivity that early tests unleashed, also remains intimately intertwined with the growth of twentieth-century ecology and environmentalism. From 1945 to 1980, over 500 open-air nuclear explosions and tests were conducted at various sites around the globe—from the American Southwest to Soviet Kazakhstan, from French Algeria to the Australian Outback, and from the South Pacific islands to inland China. Each massive explosion released radiation with 150 different fission products that turned tiny debris caught up in the blast into radioactive particles, generally called fallout, some of which fell immediately near the test sites. Depending on the yield of the blast, however, significant amounts of radioactive fallout often went sailing into the atmosphere. This dangerous debris would then circulate around the planet's

[108] Samuel P. Hays, *Beauty, Health, and Permanence: Environmental Politics I nthe United States, 1955-1985* (New York: Cambridge University Press, 1987); Adam Rome, "'Give Earth a Chance': The Environmental Movement and the Sixites," *Journal of American History* 90:2 (2003): 525-554.

stratosphere before falling back to earth, exposing humans and the environment to its radioactivity.[110] Due to long half-lives, particularly hazardous forms of fallout included novel isotopes like strontium-90 and iodine-131, created in the atomic explosion, unknown previously in the biosphere, and eventually deadly to life when immediately exposed or when absorbed over time in significant quantities. The global spread of these materials throughout ecosystems and into human bodies occurred without full public or private consideration of their risks by policy-makers, by scientists, or by unknowingly exposed publics.

No wonder, then, that Donald Worster's classic treatise on ecological thought, *Nature's Economy*, declared that along with the dawn of the Atomic Age from testing Earth's first nuclear explosion, simultaneously, "the age of ecology opened on the New Mexico desert, near the town of Alamagordo, on July 16, 1945." With atomic weapons, Worster continued, humans not only released cancerous radioactive fallout, eventually used as an unexpected tool for tracing and better understanding ecosystem dynamics; they created "a technological force that seemed capable of destroying much of the life on the planet."[111] That destructive force, and its radioactive byproducts, helped inspire social movements to prevent using that technology, both for the preservation of humanity and of the environment.

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[109] J.R. McNeill and Corinna R. Unger, eds., *Environmental Histories of the Cold War* (Washington, DC: German Historical Institute/New York: Cambridge University Press, 2010), 17.

[110] Harold L. Beck and Burton G. Bennett, "Historical Overview of Atmospheric Nuclear Weapons Testing and Estimates of Fallout in the Continental United States," *Health Physics* 82:5 (May 2002): 591-608.

[111] Donald Worster, *Nature's Economy: A History of Ecological Ideas*, Second Edition (New York: Cambridge University Press, 1994), 342.

Even before World War II ended in the wake of two nuclear blasts over Japan, some of the scientists who helped birth atomic bombs in the secret Manhattan Project feared the fatal uses of its awesome power, even if used to help end the devastation of World War II. For instance, only one day after the first successful atomic test in New Mexico in 1945, Hungarian-American nuclear physicist Leo Szilard urged against using the new atom bomb in war and called for its international control.[112] American policymakers, however, had other plans. Two atomic bombs, of course, blasted fire and radioactivity over Japan, flattening Hiroshima and Nagasaki and instantly vaporizing over 100,000 people. While World War II ended shortly thereafter, many more blasts soon followed. Not on Japanese cities and their war-weary inhabitants, but in a long regime of open-air experimental tests conducted to better understand and improve America's new atomic tool.

Only weeks after the two fission bombs fell upon Japan, the United States, then the world's only nuclear nation, announced its unilateral intentions to continue ongoing atomic tests. American scientists and the triumphant military selected as their test locations the Bikini and Enewetok atolls, far into the South Pacific.[113] In July 1946, less than a year after the end of World War II, the United States exploded two atomic bombs on the Bikini atoll under the code-name Operation *Crossroads*. In

[112] "Chicago Scientists' Petition of the President," 17 July 1945, reprinted in *Leo Szilard: His Version of the Facts*, Vol. II, edited by S.R. Weart and Gertrude Weiss (Cambridge, MA: MIT Press, 1978), 211-212. For more on some scientists' early efforts against atomic weapons see, Dexter Masters and Katherine Way, eds., *One World or None: A Report to the Public on the Full Meaning of the Atomic Bomb* (New York: McGraw-Hill, 1946); Alice K. Smith, *A Peril and a Hope: The Scientists' Movement in America, 1945-47* (Chicago: University of Chicago Press, 1965); Lawrence S. Wittner, *One World or None: A History of the World Nuclear Disarmament Movement Through 1953,* Vol. I of *The Struggle Against the Bomb* (Stanford, CA: Stanford University Press, 1993).

[113] W.A. Shurcliff, *Bombs at Bikini: The Official Report of Operation Crossroads* (New York: Wm.H. Wise & Co., Inc., 1947).

the first nuclear explosions in peacetime, *Crossroads* tested the effects of nuclear attack against a ghost fleet of captured Japanese navel vessels.[114] Additional American tests occurred in the South Pacific in 1948, but in 1949, the Soviet Union tested their own atomic weapon in what is now Kazakhstan. Proof of Soviet atomic power shocked Americans and the world, thereby escalating the stakes of an already intensifying Cold War. Other industrial powers, including the British and French, sped up their programs to create and test nuclear own bombs, despite the high economic costs during their post-war recovery. Meanwhile, as the United States prepared for a vast expansion of their own atomic testing in the South Pacific, it also opted to pursue creation of thermonuclear fusion bombs, a weapon with a thousand times the power of the bomb that destroyed Hiroshima.

American physicist, Edward Teller, the so-called "father" of thermonuclear bombs, explained that testing atomic explosives was "usually carried out in beautiful surroundings," like Bikini atoll. These militarized landscapes "must be isolated," Teller explained, for this simple reason: "radioactive fallout."[115] Atomic experts like Teller knew of deadly radiation from nuclear materials long before the Manhattan Project.[116] But fallout from nuclear explosions was a new danger, not well understood. Even with testing atomic bombs in the open air and ocean, most experts assumed radioactive fallout would dilute passively in the immediate environment

[114] Philip L. Cantelon, Richard G. Hewlett, and Robert C. Williams, eds., *The American Atom: A Documentary History of Nuclear Policies from the Discovery of Fission to the Present* (Philadelphia: University of Pennsylvania Press, 1984), 163.

[115] Quoted in Toshihiro Higuchi, "Atomic Nuclear Weapons Testing and the Debate on Risk Knowledge in Cold War America, 1945-1963," in J.R. McNeill and Corinna R. Unger, eds., *Environmental Histories of the Cold War* (Washington, DC: German Historical Institute/New York: Cambridge University Press, 2010), 303.

and would not travel beyond the proving ground. Atomic experts assured as much to inquisitive publics. As late as 1952, the same year that American scientists successfully tested the first thermonuclear device, the U.S. Atomic Energy Commission (USAEC) assured that "these explosives created no immediate or long-range hazard to human health outside the proving ground," despite solid evidence to the contrary.[117]

Realizations about environmental interconnections soon revealed surprises about the impacts of atomic testing. Radiobiological monitoring of marine life around South Pacific test sites, initiated in 1946, eventually produced new knowledge about radioactivity's ecological pathways and its dissipation in nature. Surveys at Bikini, including some conducted by ecologists Eugene and Howard Odum, revealed how living biota stored radioactivity in their tissues and passed their accumulated contamination upwards along food chains toward humans.[118] The simple solution seemed not to go near atomic test sites, and to not eat plants or animals near the site that had bioaccumlated the radioactivity in their tissues. Such a solution, however, was foiled by the growing understanding that radioactive particles could travel extremely long distances before raining as fallout on unsuspecting locations far away from the nuclear testing.[119]

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[116] Barton C. Hacker, *The Dragon's Tail: Radiation Safety in the Manhattan Project, 1942-1946* (Berkeley: University of California Press, 1987).

[117] USAEC quoted in Michael Egan, *Barry Commoner and the Science of Survival: the Remaking of American Environmentalism* (Cambridge, MA: MIT Press, 2007), 51.

[118] Neal O. Hines, *Proving Ground: An Account of the Radiobiological Studies in the Pacific, 1946-1961* (Seattle: University of Washington Press, 1962).

[119] For a detailed analysis on the environmental implications of nuclear fallout, see E. Jerry Jessee, "Radiation Ecologies: Bombs, Bodies, and Environment during the Atmospheric Nuclear Weapons Testing Period, 1942-1965," (Ph.D. diss., Montana State University, 2013).

By the late 1950s and early 1960s, the discovery that dangerous fallout traveled and fell far beyond the site of a nuclear explosion helped trigger awareness of worldwide environmental interconnection, which served as a foundational building block of the global environmental moment. While that discovery actually occurred just weeks after the world's first atomic explosion in July 1945, at the Trinity test site, the dangers of long-range and even global fallout remained little known publically. The process of understanding fallout as a global environmental hazard began unexpectedly in a manufacturing plant that produced photographic films.

In the summer of 1945, one month after the Trinity test in the New Mexican desert, the Eastman Kodak Company in the state of New York discovered radioactive contamination in the paper packaging of its sensitive photographic films. During World War II, Kodak had initiated internal radiation monitoring after contaminated paper began damaging some of their sensitive films, which occurred occasionally with recycled paper and cardboard from war-plants that prepared radium-lit instrument dials. In August 1945, Kodak registered radioactivity in its packaging, yet the paper had not come from recycled materials. Instead, the paper that Kodak received that August had been produced in Indiana and made from freshly cut corn stalks grown in Iowa. Fallout from the world’s first atomic explosion had traveled nearly 1,000 miles away from the highly secret atomic test in New Mexico the month prior to radiate the Iowa corn that eventually entered Kodak’s facility as paper. Despite publication of this occurrence in a 1949 science journal, the systematic monitoring of long-range fallout did not begin until February

1951, once again a result of radiation testing by the Kodak Company in New York.[120]

By the end of 1950, the U.S. government had selected a large area north of Las Vegas, Nevada for continental testing of nuclear weapons in the event that future conflict from the heighted Cold War might cut off American access to its Pacific testing sites. Domestic weapons testing began in the United States with Operation *Ranger* in January 1951, with more tests scheduled later that year. Almost immediately after the nuclear explosions from Operation *Ranger*, radioactive fallout spread and fell across much of the United States, particularly in Rochester, New York, where workers at the Eastman Kodak Company again discovered the sudden exposure of its films.[121]

In late January 1951, less than thirty-six hours after the first nuclear tests at the new Nevada Test Site, the Kodak manufacturing plant in Rochester, New York registered levels of radioactive contamination, this time in its air filters. Kodak quickly reported the atomic breech to a surprised USAEC. During its own monitoring at ground-zero, the USAEC found insignificant residual radiation and little local fallout after that initial Nevada test. As a result, USAEC had considered off-sight nuclear testing unnecessary. The first Nevada atomic explosion, however, had been conducted at high-altitude, spewing radioactive bomb materials into the stratosphere. Atmospheric jet streams subsequently carried the radioactive debris

[120] J. Webb, "The Fogging of Photographic Film by Radioactive Contaminants in Cardboard Packaging Materials," *Physics Review* 76 (1949): 375-380; Harold L. Beck, "Preface," *Health Physics: The Radiation Safety Journal* 82:5 (May 2002): 589-590.

across the continent, when it then fell to the Earth in a vast snowstorm that blanketed much the American northeast, including the Kodak plant in Rochester.[122]

Immediately upon Kodak's notice of New York's radioactive snow and air, a scientist named Merril Eisenbud, director of the USAEC's New York Health and Safety Laboratory (HASL), was both curious and concerned. Wondering about the range of the oddly radioactive content in the recent snowstorm, Eisenbud used his contacts with industrial companies and universities to collect and analyze additional snow samples from St. Louis, Cleveland, Rochester, Albany, New York City, and Boston. Within three days, Eisenbud and a colleague at HASL produced a map showing a surprisingly vast pattern of radioactive fallout. That single atomic explosion in Nevada, nearly one month earlier, had deposited fallout all across the Midwest and northeastern United States, where the vast majority of Americans lived. A request from the Kodak Company for warnings about future radioactive events convinced Eisenbud of the need for systematic long-range fallout monitoring.[123]

Later in 1951, both Kodak and Eisenbud learned of a new series of Nevada atomic tests planned for that fall, code-named Operation *Buster-Jangle*. Despite the earlier evidence Eisenbud produced on the far distances that potentially deadly

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[121] Philip L. Cantelon, Richard G. Hewlett, and Robert C. Williams, eds., *The American Atom: A Documentary History of Nuclear Policies from the Discovery of Fission to the Present* (Philadelphia: University of Pennsylvania Press, 1984), 164.

[122] Harold L. Beck and Burton G. Bennett, "Historical Overview of Atmospheric Nuclear weapons Testing and Estimates of Fallout in the Continental United States," *Health Physics: The Radiation Safety Journal* 82:5 (May 2002): 591-608; Lester Machta, "Meteorological Factors and Fallout Distribution in Low Level Radiation," *Science*

[123] John H. Harley, "A Brief History of Long-Range Fallout," Report HASL-306:I-3 to I-19 (New York: U.S. Atomic Energy Commission, 1976); M. Eisenbud, "The First Years of the Atomic Energy Commission New York Operations Office Health and Safety Laboratory," *Environment International* 20:5 (1994): 561-571; Harold L. Beck and Burton G. Bennett, "Historical Overview of Atmospheric

fallout had traveled earlier that year, he learned that the USAEC still had no plans for monitoring *Buster-Jangle*'s fallout beyond the 200 mile range of the Nevada Test Site. Upon Eisenbud's insistence, the USAEC agreed to support HASL for monitoring out to 500 miles. Unsatisfied, Eisenbud devised and established his own monitoring network spread much farther out at sixty-one different weather stations throughout the United States.[124]

Based on his experience with the exposure of Kodak films to radioactivity, Eisenbud devised a novel but simple method of testing for fallout deposition. He simply fitted most stations with a stand that held a flat tray, almost like serving a TV dinner, on which he placed gummed Kodak film. The films were simply exposed to the air, collecting whatever fallout and other debris the weather dropped from the sky. After an established timeframe in the wake of the Nevada tests, the disparate weather stations folded and mailed the films in envelopes to Eisenbud's laboratory in New York. There, the HASL analyzed the films to infer levels of individual radionuclides from the fallout samples.[125]

The analysis from the collective fallout films revealed the spread of dangerously radioactive iodine-131, cesium-137, and strontium-90 across large swaths of the continental United States, not simply near the Nevada test site. For the series of atomic tests the next year in 1952, the fallout-monitoring network expanded

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Nuclear weapons Testing and Estimates of Fallout in the Continental United States," *Health Physics: The Radiation Safety Journal* 82:5 (May 2002): 591-608.

[124] M. Eisenbud, "The First Years of the Atomic Energy Commission New York Operations Office Health and Safety Laboratory," *Environment International* 20:5 (1994): 561-571; Harold L. Beck and Burton G. Bennett, "Historical Overview of Atmospheric Nuclear weapons Testing and Estimates of Fallout in the Continental United States," *Health Physics: The Radiation Safety Journal* 82:5 (May 2002): 591-608.

[125] Ibid.

to over 100 weather stations—this time spread all around the world. All of them used Eisenbud's film-measurement process. To his great surprise, fallout had become a worldwide phenomenon, especially the spread of strontium-90. In the few years since the Earth's first atomic explosions in 1945, previously unknown and carcinogenic particles of radioactive fallout had traveled throughout the planetary atmosphere, all across Spaceship Earth, to contaminate not just places where atomic testing occurred, but to pollute swaths of the entire planet. Here, was initial scientific evidence of human technology's unintended production of a global environmental hazard, yet understanding of its ecological pathways remained limited. Only a select few knew of its dangers, and Cold War imperatives at the time prioritized national security over environmental security. By the mid-1950s, however, after an atomic test accident, the dangers of fallout became both public knowledge and a political controversy, and eventually a key instigator for global environmental awareness.[126]

Global Fallout Creates Global Controversy

The USAEC, facing a new global hazard, developed a detailed understanding of fallout's flow throughout ecosystems thanks to the federally funded work of ecologists like the Odum brothers. Their work helped identify the radioactive isotope strontium-90 as nuclear fallout's greatest long-term threat to humans because of its twenty-nine-year half-life, and its ability to follow metabolic calcium pathways throughout the global environment. In the wake of an atomic blast and after raining as fallout onto soils, strontium-90 traveled as calcium would, being absorbed from

[126] Ibid.

soil into plants and then into animals, ultimately moving up food chain into human bodies, often through milk and calcium-rich vegetables. Strontium-90 isotopes then accumulated in human bones—especially in the growing bones of milk-drinking children—all the while releasing carcinogenic radiation internally over a period of nearly thirty years. After concentrating in bone and teeth, strontium-90 produced deadly bone cancers, cancer of soft tissues near bones, and leukemia. Throughout the 1950s and early 1960s, increased understanding of this deadly threat, and growing realizations about its surprising spread globally, pushed planetary environmental awareness toward the global environmental moment.[127]

In the early 1950s, fallout threats from atomic testing escalated across multiple fronts, to mention nothing of the catastrophic and pervasive danger that nuclear weapons might be used not for testing but in worldwide war. In November 1952 during Operation *Ivy* on Eniwetok Atoll in the South Pacific, the United States exploded the world's first thermonuclear bomb, elevating Cold War tensions and the dangerous spread of dangerous fallout. Afterward, the USAEC forbid thermonuclear testing in Nevada due to concerns about fallout's effects on Americans. However, the thermonuclear success created a new national need to obtain more precise measurements for designing and testing future hydrogen weapons in the Pacific.[128]

In 1953, a series of continental tests in Nevada code-named *Upshot-Knothole* were designed to better assess and measure the effects of atomic explosions. The

[127] U.S. Environmental Protection Agency, "Radiation Protection: Strontium," http://www.epa.gov/radiation/radionuclides/strontium.html (accessed Dec. 19, 2013).

[128] Philip L. Cantelon, Richard G. Hewlett, and Robert C. Williams, eds., *The American Atom: A Documentary History of Nuclear Policies from the Discovery of Fission to the Present* (Philadelphia: University of Pennsylvania Press, 1984), 164-165.

Upshot-Knothole's tests in the spring of 1953, fired from 300-foot towers, produced for the first time a giant atomic fireball that swept up vast amounts of debris from the desert floor, which rained as radioactive fallout across large swaths of Utah and Nevada. Some estimates indicated that eighty percent of offsite fallout from U.S. continental testing came directly from the *Upshot-Knothole* series. While the threats of fallout remained mostly unknown to the public in 1953—and, for that matter, still not well understood by the USAEC—the *Upshot-Knothole* debacle caused the USAEC to establish tighter restrictions on continental weapons testing, including for the first time analysis on expected weather patterns, which heavily influenced the degree and direction of fallout. However, just two months after *Upshot-Knothole* concluded, the Soviet Union detonated its first thermonuclear device, and in 1953, the United Kingdom tested its first fission bomb. These events escalated Cold War dangers, intensified the race for creating and testing increasingly powerful nuclear weapons, and thereby elevated the amount, spread, and threat of radioactive fallout.[129]

Also in 1953—amid these increasing dangers and with initial evidence but limited data of fallout as a planetary threat—the USAEC together with the U.S. military and systems analysts at RAND in Santa Monica, California inaugurated a secret study named Project Sunshine. Project Sunshine conducted a worldwide survey to determine the levels of strontium-90 contamination created by atomic testing. It included international soil and ocean sampling, stratospheric air sampling from balloons and planes, and monitoring of raw and pasteurized milk, among other

[129] Ibid.

data collection strategies. Project Sunshine confirmed that motley geophysical dynamics, many of which experts barely understood, carried fallout far beyond test sites where it fell and worked its way up food chains to saturate human foods. Across the world, unsuspecting publics and especially children were consuming and accumulating strontium-90. As a totally novel phenomenon, no one knew whether the amounts of accumulation were acceptable or would be lethal. They simple knew strontium-90 could eventually cause cancer and now permeated the planet. The ongoing study remained classified until its unveiling in 1957 amid the global data collection efforts of the IGY that year. However, it was before that, in 1954, when the radioactive dangers of fallout impressed itself on the public consciousness, eventually spurring a major public controversy over fallout and fueling massive participation in a global social movement to curb atomic testing. That widespread and influential social movement against atomic testing proved to be a precursor to what became a related social movement for protecting the global environment.[130]

In 1954, Japanese victims once again ushered in a new awareness of nuclear weapons' deadly power—this time not as victims from nuclear bombs used in war but simply from Americans' atomic testing. That year, the USAEC returned to Bikini atoll for a new round of thermonuclear testing, code-named the *Castle* series. In the shot named *Bravo*, the first of the *Castle* series tests on March 1, U.S. atomic scientists exploded a device nicknamed Shrimp and anticipated a sizeable six-

[130] Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (New York: Oxford University Press, 2013), 102-104; Barton C. Hacker, *Elements of Controversy: The Atomic Energy Commission and Radiation Safety in Nuclear Weapons Testing* (Berkeley: University of California Press, 1994), 181-184; Egan, *Barry Commoner*, 51-52; Lawrence S. Wittner,

megaton yield. Surprisingly, *Bravo* far exceeded the scientists' expectations, blasting a massive yield of fifteen megatons, one thousand times larger than the device that leveled Hiroshima and still the largest atmospheric detonation ever conducted by the United States. With the aid of unexpected winds, the *Bravo* shot spread immense amounts of highly radioactive debris from Bikini, far beyond the USAEC's declared danger zone, exposing the South Pacific's unsuspecting and unprotected native islanders to fallout hundreds of miles away.[131]

Far more famously, a group of Japanese men also fell victim to *Bravo*'s uncontrolled explosion. Outside the USAEC's danger zone but within reach of *Bravo*'s fallout, radioactive ash also showered upon the crew of the *Fukuryu Mara*, a Japanese fishing trawler whose name translated ironically as the *Lucky Dragon*. By the time the vessel returned to port two weeks later in Yaizu, Japan, nearly all unlucky crewmembers suffered advanced stages of radiation sickness, and one died six months later during hospital treatment. By the time the *Lucky Dragon* reached home with its harrowing news, contaminated fish from other vessels had already sold at ports all across Japan. The event collapsed Japan's fish market and inflamed painful memories of prior atomic traumas. News of the United States' uncontrolled atomic testing, with its cancerous and far-reaching radioactive fallout, spread like a firestorm in media outlets around the world. Here, the early Cold War period,

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Confronting the Bomb: A Short History of the World Nuclear Disarmament Movement (Stanford, CA: Stanford University Press, 2009), 52.

[131] Philip L. Cantelon, Richard G. Hewlett, and Robert C. Williams, eds., *The American Atom: A Documentary History of Nuclear Policies from the Discovery of Fission to the Present* (Philadelphia: University of Pennsylvania Press, 1984), 164-165.

provided a clear example of uncontrolled technology unintentionally threatening human health, economies, and large sections of the environment.[132]

The *Bravo* debacle first indicated to a broad global public that atomic explosions were not singular and locally contained events; they produced a lasting danger that threatened people far and wide, even future generations. It was through the fear of fallout that the nuclear threat combined with a powerful new fear of cancer from environmental poisoning. As such, fear of the nuclear dragon converged with a collection of anxieties about the implications of science on society in an increasingly globalized civilization, and potentially worldwide dangers growing technological powers posed for the security and sanctity of life on Spaceship Earth. Reaction to the *Bravo* event almost immediately ignited worldwide protests to ban nuclear weapons, or if more realistically, to at least limit the increasingly real and now patently public dangers of fallout from atomic testing.

Dr. Albert Schweitzer, who received the 1952 Nobel Peace Prize, delivered his Nobel lecture titled "The Problem of Peace" in November 1954—the same year that the *Bravo* shot's unexpected atomic yield rained fallout across a vast expanse of ocean, on Pacific islanders and Japanese fishermen, and catapulted the threat of atmospheric atomic explosions into global consciousness. In his peace lecture, Schweitzer spoke of the scientific and technological horrors of modern war,

[132] The best account of the *Bravo* shot and the ensuing debates over fallout and arms control in the United States remains Robert A. Divine, *Blowing on the Wind: The Nuclear Test Ban Debate, 1954-1960* (New York: Oxford University Press, 1978). For more international appraisals, see Wittner, *Resisting the Bomb*; Matthew Evangelista, *Unarmed Forces: The Transnational Movement to End the Cold War* (Ithaca, NY: Cornell University Press, 1999). For another take on *Bravo* in the context of global environmentalism, see John McCormick, *The Global Environmental Movement* (West Sussex, UK: John Wiley & Sons, 1995), 62.

especially the "vast forces liberated by the splitting of the atom." Given radioactivity's mutating effect on living things, he warned that nuclear weapons not only threatened the horrific possibility of perhaps world-ending nuclear holocaust in war, but the new evidence from *Bravo* that "large-scale tests could unleash catastrophes threatening the very existence of the human race." Perhaps then, Schweitzer argued, in the face of such universal threats, humanity could come to terms with the necessity of creating a world in which global war would become—must become—an impossibility. Yet, he believed these shared threats alone would not unify the world toward peace. Only the ethical extension of humanity to all peoples, a prevailing spirit of humanism, could liquidate war and ensure increased attainment of happiness for all people. Schweitzer had loosely extended realizations about globally interconnected ecosystems and the dangers of fallout from the *Bravo* test and applied them to global politics as a requisition for world peace. He adjusted a scientific systems-thinking framework to a holistic social imperative toward peace and the end of atomic explosions, to save humanity from war and protect the planet's ability to support life.[133]

Over the next several years, throughout the late 1950s and early 1960s, a massive citizens' movement against nuclear weapons spread around the world, all while scientists in the United States, Japan, and elsewhere continued learning new ways that geophysical forces dispersed radioactive fallout throughout the global environment. The *Bravo* event initiated a major controversy between leading

[133] Albert Schweitzer, "The Problem of Peace," Nobel Lecture (November 4, 1954), http://www.nobelprize.org/nobel_prizes/peace/laureates/1952/schweitzer-lecture.html, accessed March 24, 2013).

scientists, international activists, and national governments over "safe-levels" of fallout.[134] Fierce supporters of the USAEC and the American Cold War, like Edward Teller, acknowledged the reality of fallout but tended to claim its levels posed little harm. In February 1955, the USAEC released a report saying as much. But despite the lingering taint of McCarthyism, other more politically active scientists, like Nobel laureate in chemistry Linus Pauling and biologist Barry Commoner, challenged the Cold War logic of increased armaments at all costs. Many scientists criticized the claims of government, noting that any amount of radioactivity might cause cancer, so no clear threshold of safety was possible. And they questioned whether the few nuclear nations had the natural right to militarize and contaminate the global commons of air, land, and sea with ongoing and increasingly powerful atomic tests. Atomic fears inspired scientific and political activist to protect people across the planet, which in turn meant protecting the global environment.[135]

Fallout Politics and Scientific Activism

Spurred by an omnipresent fear of atomic annihilation and newly realized dangers to human health from testing nuclear weapons, a fleet of antinuclear

[134] U.S. National Academy of Sciences, *The Biological Effects of Atomic Radiation: A Report to the Public* (Washington, DC: National Academy of Sciences/National Research Council, 1956); Medical Research Council (Great Britain), *The Hazards to Man of Nuclear and Allied Radiations* (London: Her Majesty's Stationary Office, 1956); United Nations, *Report of the United Nations Scientific Committee on the Effects of Atomic Radiation*, UN General Assembly (XIII), Supplement 17, 1958, Doc. A/3838.

[135] Carolyn Kopp, "The Origins of the American Scientific Debate of Fallout Hazards," *Social Studies of Science* 9:4 (November 1979), 403-422; Jacob Darwin Hamblin, "'A Dispassionate and Objective Effort:' Negotiating the First Study on the Biological Effects of Atomic Radiation," *Journal of the History of Biology* 40:1 (March 2007), 147-177; John McCormick, *The Global Environmental Movement* (West Sussex, UK: John Wiley & Sons, 1995), 62; Kelly Moore,

organizations sprung up across the industrialized global North, including Britain's Campaign for Nuclear Disarmament (CND), Japan's Gensuikyo, the United States' National Committee for a Sane Nuclear Policy (SANE), the Dutch Committee for the Abolition of the Atomic Bomb, and West Germany's Struggle Against Atomic Death. Transnational pacifist and religious organizations, from Pope Pius XII to the International Fellowship of Reconciliation, along with leaders in Latin America, India, and even in some non-governmental groups in communist nations collectively expressed their distaste for nuclear weapons and concerns over the deadly threats of testing. Renowned humanitarians and intellectuals like Schweitzer, Norman Cousins, and Bertrand Russell joined to advocate against atomic madness. Leading physicists, including Albert Einstein, Joseph Rotblat, Eugene Rabinowich, and Soviet physicist Andrei Sakharov lend scientific authority the antinuclear campaigns. Collectively, their incessant advocacy informed and rallied many millions of citizens on nearly every continent.[136]

The fallout controversy soon became a global issue with global consequences. If the explosive release and spread of man-made radioactivity through Earth's geophysical forces had made fallout a global phenomenon, so too was the scientific and social movement opposing nuclear weapons and testing. By the early 1960s, the evolution of worldwide antinuclear activism would evolve into related activism for protecting the global environment. But, before atomic protests provoked environmental activism and became a point of political debate over global

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Disrupting Science: Social Movements, American Scientists, and the Politics of the Military, 1945-1975 (Princeton: Princeton University Press, 2008), 99-102.

[136] Wittner, *Resisting the Bomb*, 1-82.

environmental problems, the controversy over fallout first had to become a political issue itself.

In 1956, nearly a decade before his famous speech saying we travel together on Spaceship Earth, Adlai Stevenson officially made nuclear testing a political issue in the United States. Having lost the 1952 presidential election to General Dwight Eisenhower, Stevenson again became the Democratic nominee in 1956. Since *Bravo*, Stevenson had grown concerned about the dangers from fallout. While campaigning across the country, Stevenson kept his research aids busy sending inquiries to leading domestic and international scientific experts. He accumulated data and searched for answers to his questions on the ways nuclear fallout contaminated fields where cattle grazed, followed calcium pathways, and ended up in milk given to children by unsuspecting mothers. In April 1956, before the American Society of Newspaper Editors and against the advice of his campaign managers, Stevenson sought to "strike a blow for humanity" by speaking vigorously against testing thermonuclear weapons. He called for an international test ban agreement, overseen by the United Nations. "We desperately need today," Stevenson said, "a rebirth of ideas." In light of the global dangers from fallout and heedless nuclear testing, Stevenson scolded, "We have lost the moral initiative and the rest of the world knows it."[137] While Eisenhower avoided public discussion of testing, Stevenson dedicated an entire television address on the perils of H-bomb testing titled, "The

[137] Adlai Stevenson, Address to the American Society of Newspaper Editors in Washington, D.C., April 21, 1956, in *The Papers of Adlai E. Stevenson, Vol. VI: Toward a New America, 1955-1957*, edited by Walter Johnson (Boston: Little, Brown, and Company, 1976), 110-121. See also, Ken Hechler, "Stevenson: Concerned and Brilliant—His Finest Hour Was in Seeking a Nuclear Test Ban,"

Greatest Menace the World Has Ever Known." To Stevenson's disfavor, a host of Cold War instabilities that year, including the Soviet invasion of Hungary and the Suez Crisis in Egypt, helped Eisenhower win re-election. Despite the loss, Stevenson pressed his point to end testing in 1957 with articles in popular magazines, like *Look*.[138]

Politically active scientists also made headlines promoting an end to atomic testing and the need for unclassified information to help American citizens make their own informed decisions about its risks. Barry Commoner, a plant biologist at Washington University in St. Louis, became heavily involved in public campaigns to inform citizens on the difficult scientific issues involved in nuclear testing, fallout, and its health threats. This included his work in the American Association for the Advancement of Science (AAAS). Through the AAAS, Commoner organized an Interim Committee on the Social Aspects of Science, which expanded to become the Committee on Science in the Promotion of Human Welfare, where he worked closely with Margaret Mead orchestrating symposiums on fallout and other environmental threats over the next decade. Linus Pauling, a biochemist who became a Nobel laureate for his work on the nature of chemical bonds, also became a highly public and authoritative proponent against the moral imperatives of cancer-inducing atomic tests, delivering lectures across the nation on nuclear dangers.[139]

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in *Adlai Stevenson's Lasting Legacy*, edited by Alvin Liebling, (New York: Palgrave Macmillan, 2007), 49-55.

[138] Adlai E. Stevenson II, "About the H-Bomb," *Look* magazine (February 5, 1957), reprinted in *Adlai Stevenson's Lasting Legacy*, edited by Alvin Liebling, (New York: Palgrave Macmillan, 2007), pp 57-64.

[139] Rae Goodell, *The Visible Scientists* (Boston: Little, Brown, and Co., 1977), 60-69, 70-88. See also Michael Egan, *Barry Commoner and the Science of Survival: the Remaking of American Environmentalism* (Cambridge, MA: MIT Press, 2007).

In 1957, Pauling traveled to St. Louis to deliver a speech on the role of science in the modern world. Upon meeting there with Commoner to discuss the dangers of fallout, Pauling, Commoner, and Washington University physicist Edward U. Condon drafted in Barry Commoner's office a petition for an international agreement to end nuclear weapons testing. The statement, which carried clear global environmental themes, noted how "each nuclear bomb spreads an added burden of radioactive elements over every part of the world." The petition, written specifically for scientists to sign, requested their help in mediating scientific information to a public not entirely aware of the environmental health and safety implications of fallout. Pauling sent the petition to collect signatures and within two weeks over twenty-six hundred American scientists had signed it. Upon its international circulation, the petition secured signatures from over 11,000 scientists in forty-nine nations, including thirty-seven Nobel laureates, more than a fifth of the U.S. National Academy of Sciences, ninety-five fellows of the Royal Society of London, and over 200 members of the Soviet Academy of Sciences. Pauling soon left his position at Cal Tech to become an apostle against nuclear dangers, publishing the book *No More War!* in 1958 and clashing repeatedly in magazines, books, and television with pro-nuclear zealot, Edward Teller. Pauling eventually presented his petition, signed by thousands of the world's authoritative scientific experts, to the United Nations to encourage its demand to end nuclear weapons testing.[140] Pauling's

[140] Linus Pauling, "An Appeal by American Scientists to the Governments and People of the World," *Bulletin of the Atomic Scientists* 13 (September 1957; Michael Egan, *Barry Commoner and the Science of Survival*, 55; Kelly Moore, *Disrupting Science*, 110-111; Wittner, *Resisting the Bomb*, 37-39.

actions for influencing the UN with the authority of scientists became a model ten years later for activists concerned about the global environment.[141]

Barry Commoner also continued his political efforts against nuclear testing to create an informed citizenry for the long-term health both of American democracy and its people. Like Pauling's famous confrontations with nuclear enthusiast Edward Teller, Commoner also clashed with other scientists, particularly those working under the auspices of the USAEC. In 1958, Commoner helped found the Greater St. Louis Committee for Nuclear Information (CNI) to present facts about fallout and other nuclear issues for an American public deeply confused over the debate and controversy between leading scientists on the issue. Similar organizations sprung up around the nation to form a leading grassroots instrument in the campaign against nuclear testing. Commoner delivered public talks and wrote influential articles on "The Fallout Problem," published in *Science* in 1958. Later that year, the Committee for Nuclear Information began its publically powerful Baby Tooth Survey, which collected thousands of children's teeth from across the country to examine their strontium-90 levels. By measuring and confirming children's widespread absorption of radioactivity from atomic testing, Commoner helped inform the public about the dangers of fallout and about intricate interconnections between human actions and the environment.[142]

By following the biological pathways of nuclear fallout, Commoner and others developed an increased appreciation for large-scale ecological relationships.

[141] See Chapter 7 of this dissertation.

[142] Barry Commoner, "The Fallout Problem," *Science* 127 (May 2, 1958), 1023-1026; Egan, 47-73.

Through his work with CNI and the Baby Tooth Survey, Commoner studied the environmental pathways of fallout from atomic testing, including its global spread on jet streams throughout the atmosphere, its descent to the earth and absorption through the soil into plants, and eventually into human bodies. His expertise as a plant biologist and his research as an anti-nuclear activist led Commoner to describe the test explosions of nuclear weapons as "the greatest single cause of environmental contamination of this planet."[143] So, eventually, did much of the world, thanks in part to the efforts of Commoner, Pauling, and other concerned scientists. The massive anti-nuclear campaign to which Commoner and Pauling contributed helped lay the groundwork for widespread understanding of worldwide ecological interconnections, which in turn inspired the social and political activism of the global environmental moment.

Jacob Hamblin has argued that, "the fallout controversy was a major turning point in global environmental awareness." Not only did it inspire the activism of politically engaged scientists, it also seized the attention and concern of laymen and national governments around the world, including their representatives to the UN. Additionally, as Hamblin noted, the fallout controversy "raised questions of culpability and responsibility. It suggested that the Soviet Union, the United States, and, in fact, all nuclear powers had the ability to take actions with far-reaching, unpredictable, and deadly consequences even in peacetime," and with implications

[143] Barry Commoner, "Fallout and Water Pollution—Parallel Cases," *Scientist and Citizen* 6 (December 1964), 2-7, here 2.

that could negatively impact future generations.[144] Indeed, over the ensuing decade, Barry Commoner became one of the leading voices of the global environmental movement that began in industrialized nations with nuclear histories, and soon spread with global considerations—in part because of the global implications of atomic fallout. Commoner admitted later that it was the USAEC that had turned him into an environmentalist.[145]

In 1958, American President Eisenhower appeared torn between worldwide popular concern against the harmful effects of testing, and his desire not to permit hysterical public opinion to, as he put it, crucify the United States "on a cross of atoms." Early in 1958, the Soviet Union unilaterally announced its future plans for a temporary moratorium on testing to begin at the end of that October. By the summer of 1958, public opinion and political opportunity combined to shape Eisenhower's own announcement to temporarily halt American testing. The President admitted in a meeting to pro-nuclear stalwarts, including Edward Teller, that, "new thermonuclear weapons are very powerful; however, they are not … as powerful as is world opinion today." With a new realization over the meaning of national security, Eisenhower agreed temporarily to halt nuclear explosions by the end of 1958.[146]

In anticipation of the impending moratorium, the governments of the United States, Britain, and the Soviet Union quickly concluded a flurry of final nuclear tests,

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[144] Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (New York: Oxford University Press, 2013), 95.

[145] Michael Egan, *Barry Commoner and the Science of Survival*, 46.

[146] Eisenhower quoted in Wittner, *Resisting the Bomb*, 179, 182. See also Robert A. Divine, *Blowing on the Wind: The Nuclear Test Ban Debate* (New York: Oxford University Press, 1978); Benjamin P. Greene, *Eisenhower, Science Advice, and the Nuclear Test-Ban Debate, 1945-1963* (Stanford: Stanford University Press, 2007), especially 134-199.

more than ever before, which generated previously unprecedented amounts of global fallout. The British tested five thermonuclear bombs at its South Pacific test site on Christmas Island; the Soviets tested some thirty bombs at its two interior test sites; while the United States alone exploded over seventy bombs between its two test sites in the Pacific and Nevada, as well as three secret explosions launched from rockets and detonated in the upper atmosphere above the South Atlantic Ocean. But true to their word, at the end of October 1958, nuclear explosions around the world temporarily ceased.[147] Fallout, the first widely recognized global environmental problem, would still rain from the sky after the final flurry of testing in 1958. But momentum built for a permanent political solution to this planetary environmental hazard.

Fallout's Gateway to Global Environmentalism

Through the end of the 1950s and throughout the 1960s, efforts toward solving the worldwide problem of atomic fallout, with its clear environmental implications, helped inspire widespread awareness about solving other global environmental problems.

In 1959, amid the growing public protest and concern against atomic weapons, the three nuclear powers engaged in negotiations for a formal international test ban treaty in hopes of making permanent the temporary ban from late 1958. As they did, however, the antinuclear movement continued to grow apace, and for good reason. During the testing moratorium, in February 1960, France successfully

[147] Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism*

conducted its own atomic explosion in the Sahara desert of its Algerian colony.[148] After more than a year without atomic explosions, the French nuclear detonation spurred a resumption of nuclear testing, first by the Soviets and quickly followed by the United States.

The renewed spate of testing between 1961 and 1962 was both greater in number and power than any prior collection of explosions, producing devastating amounts of atmospheric global fallout. These tests included the largest bomb ever exploded then or since: the Soviet Union's enormous "Tsar Bomba," estimated at nearly sixty megatons, a single thermonuclear device equivalent to nearly 4,000 of the bombs that annihilated Hiroshima. For its part, the United States detonated over 100 weapons in both the kiloton and megaton range.[149] And while the dangers from nuclear testing grew, so did the threat of their actual use in war. In October 1962, American and Soviet policymakers narrowly avoided a full-scale nuclear holocaust during the Cuban Missile Crisis. That October, even as thermonuclear testing proceeded posthaste *during* the crisis, the world nearly slipped down an atomic abyss to its a cataclysmic end.[150]

That next month, in September 1962, a quiet science writer and former marine biologist with U.S. Fish and Wildlife Service published a controversial and transformational book titled *Silent Spring*. Environmental scholars compulsorily cite

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(New York: Oxford University Press, 2013), 121.

[148] Robert A. Divine, *Blowing on the Wind: The Nuclear Test Ban Debate* (New York: Oxford University Press, 1978), 288, 298; Wilfrid L. Kohl, *French Nuclear Diplomacy* (Princeton: Princeton University Press, 1971).

[149] Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (New York: Oxford University Press, 2013), 125.

[150] Aleksandr Fursenko and Timothy Naftali, *'One Hell of a Gamble': Khrushchev, Castro, and Kennedy, 1958-1964* (New York: Norton, 1997).

Rachel Carson's *Silent Spring* as helping ignite what exploded over the decade into widespread awareness and concern for the global environment.[151] Carson's paradigm-shifting analysis was originally published in the *New Yorker* throughout 1962, and then, that September, as an immediate bestselling book. *Silent Spring* urged against the widespread application of cancerous, persistent, and bioaccumulating chemical pesticides, especially synthetic chlorinated hydrocarbons like DDT. But similar to Barry Commoner, Carson used widespread fears about fallout and atomic anxieties to promote new conceptions about environmental relations. As argued by historian Ralph H. Lutts, "People in the United States and throughout the world were prepared or pre-educated, to understand the basic concepts underlying Rachel Carson's *Silent Spring* by the decade-long debate over radioactive fallout preceding it. They had already learned that poisons, in this case radioactive ones, could create a lasting global danger."[152] Carson simply expanded that public understanding to consider additional human-induced environmental hazards, in her case, the extensive application of chemicals that she labeled "a new kind of fallout."[153]

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[151] See, for instance, Max Nicholson, *The Environmental Revolution: A Guide for the New Masters of the World* (New York: McGraw-Hill Book Co., 1970), 222-223; Samuel P. Hays, "From Conservation to Environment: Environmental Politics in the U.S. Since World War II," in *Environmental History: Critical Issues in Comparative Perspective*, ed., Kendall E. Bailes (New York: University Press of America and the American Society for Environmental History, 1985), 214; Kirkpatrick Sale, *The Green Revolution: American Environmental Movement, 1962-1992* (New York: Hill and Wang, 1993), 3-8; John McCormick, *The Global Environmental Movement*, Second Edition (New York: John Wiley & Sons, 1995), 65-67; Ramchandra Guha, *Environmentalism: A Global History* (New York: Addison Wesley Longman, Inc., 2000), 69-73. The best biography of Carson remains Linda Lear, *Rachel Carson: Witness for Nature* (New York: Henry Holt & Co., 1997).

[152] Ralph H. Lutts, "Chemical Fallout: Rachel Carson's *Silent Spring*, Radioactive Fallout, and the Environmental Movement," *Environmental Review* 9:3 (Autumn 1985), 210-225, here 212.

[153] Rachel Carson, *Silent Spring* (New York: Houghton Mifflin, 2002, c1962), 39.

In *Silent Spring*, Rachel Carson clearly linked the public's keen awareness about the threats of nuclear fallout to highlight related dangers about chemical pesticides. Carson dedicated *Silent Spring* to outspoken anti-nuclear advocate Dr. Albert Schweitzer by including his admonition that "Man has lost the capacity to foresee and to forestall. He will end by destroying the earth." For her own appraisal, Carson declared that, "Along with the possibility of the extinction of mankind by nuclear war, the central problem of our age has therefore become the contamination of man's total environment with such substances of incredible potential for harm—substances that accumulate in the tissues of plants and animals and even penetrate the germ cells." Those substances were novel classes of synthetic chemicals used all around the world, and their connection to fallout was overt. With humanity's "now universal contamination of the environment," she argued, "chemicals are the sinister and little recognized partners of radiation in changing the very nature of the world—the very nature of life." Carson wondered, "We are rightly appalled by the genetic effects of radiation; how then, can we be indifferent to the same effect in chemicals that we disseminate widely in our environment?"[154]

With her authoritative scientific evidence, Carson convinced millions of readers that "the parallel between chemicals and radiation is exact and inescapable." Noting pathways also followed by strontium-90, Carson detailed how chemicals applied to crops, gardens, or trees similarly leached into the soil and water to enter living organisms and food systems, thereby "passing from one to another in a chain of poisoning and death." *Silent Spring*'s parting words lamented, "It is our alarming

[154] Rachel Carson, *Silent Spring* (New York: Houghton Mifflin, 2002, 1962c), quotes from iv, 8,

misfortune that so primitive a science has armed itself with the most modern and terrible weapons, and that in turning them against the insects it has also turned them against the earth."[155] Through the related examples of radioactive fallout and chemical pesticides, Carson helped make explicit humanity's connections to nature, while also opening up new ways of conceptualizing the global scale of that bond. Carson lay bare how humanity's technological ingenuity could have devastating planetary repercussions.

At once enlightening, controversial, culturally influential, and immediately popular, *Silent Spring* sold half-a-million hardcover copies in the United States—rare for a scientific work of nonfiction—and it remained on the *New York Times* best-seller list for thirty-one weeks. *Silent Spring* was also rapidly translated into numerous languages and sold throughout most the industrialized world. Translations were sold in Germany in 1962; in France, Italy, Denmark, Holland, Finland, and Sweden in 1963; and in 1964 it became available in Spanish and Portuguese for readers in Europe and South America. Additionally, popular newspapers and magazines around the world carried abridged selections of *Silent Spring*. Hundreds and thousands of readers, who may never have touched her book, read significant sections of it in their regional newspapers, along with numerous reviews that appeared widely, from communist Hungary and Yugoslavia to all the nations in Western Europe.[156]

6, 37.

[155] Rachel Carson, *Silent Spring* (New York: Houghton Mifflin, 2002, 1962c), quotes from 208, 6, 297.

[156] "*Silent Spring*, International Bestseller," as part of Mark Stoll, "Rachel Carson's *Silent Spring*, a Book that Changed the World" Environment & Society Portal,

To a powerful degree, Carson's scientific research educated her world of readers in beautiful, accessible, and devastating prose how an array of modern practices—including but not limited to nuclear testing and pesticide application—endangered the web of life that maintained human and environmental health. Although environmental scholars have revealed the much deeper roots of the environmental consciousness that arose throughout the 1960s, nearly all such scholars credit *Silent Spring* as one the most influential contributions that galvanized widespread public concern and support for environmental issues, in part by communicating clearly the main ideas of ecosystem thinking to a wide public audience.[157] Looking back from 1969, as the environmental movement gathered global momentum, British conservationist Max Nicholson—himself an early international figurehead of the new environmentalism—described *Silent Spring* as "probably the greatest and most effective single contribution" to "informing public opinion on the true nature and significance of ecology."[158]

In the early 1960s, while systems thinking slowly moved from scientific laboratories to managerial boardrooms to the realms of civil government, Carson's bestselling book evangelized to an enormous audience the holistic relations of ecosystem ecology, the essential interdependences that connected humans to their environments, and the deadly consequences of destroying those relations. As a result, *Silent Spring* helped reshape public and political thought, both in the United

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http://www.environmentandsociety.org/exhibitions/silent-spring/silent-spring-international-best-seller, accessed February 14, 2014.

[157] Mark Stoll, "Rachel Carson's *Silent Spring*, a Book that Changed the World," Environment & Society Portal, http://www.environmentandsociety.org/exhibitions/silent-spring/overview, accessed February 14, 2014. See also previous citations in footnote 47, above.

States and abroad, about the unsettling impacts that science, technology, industrial expansion, and abiding national governments had on the natural environment.

Moving from one environmental and political crisis to another, U.S. President John F. Kennedy immediately faced questions about the use of dangerous chemicals named in *Silent Spring*, while his administration simultaneously pursued a nuclear test ban agreement to end global fallout. To address the wave of criticism by the chemical industry and some chauvinistic scientists against Carson's scientific claims, Kennedy dispatched the Life Sciences Panel of the President's Science Advisory Committee (PSAC) to evaluate her work. In May 1963, one month after CBS aired a lengthy television documentary on *Silent Spring*, PSAC released its report confirming that, frighteningly, all the dangers described by Carson were true.[159] Validation from a group leading scientific authorities elevated public concern of environmental threats, including the link between the chemical dangers in *Silent Spring* and the radioactive dangers of atomic fallout. In July 1963, in an effort to curb growing international agitation against one of those environmental dangers—atomic fallout—Kennedy re-initiated disarmament negotiations for a treaty to end or at least limit nuclear testing by the world three most powerful nuclear nations.

In August 1963, the United States, Britain, and the Soviet Union agreed to a Limited Test Ban Treaty (LTBT), which essentially ended their creation of fallout by forbidding their nuclear testing in the open air, above the atmosphere, or in the sea,

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[158] Nicholson, *The Environmental Revolution*, 222.

[159] Zuoyue Wang, "Responding to Silent Spring: Scientists, Popular Science Communication, and Environmental Policy in the Kennedy Years," *Science Communication* 19:2 (December 1997), 141-163; Zuoyue Wang, *In Sputnik's Shadow: The President's Science Advisory Committee and Cold War America* (New Brunswick, NJ: Rutgers University Press), 199-218.

while still permitting underground testing.[160] In addition to allowing continued nuclear testing underground, the LTBT was also limited by not including the newly atomic France, and later China, both of who continued to detonate atmospheric nuclear explosions into the mid-1970s and early 1980s, respectively. Nonetheless, Barry Commoner described the LTBT as "the first victorious battle in the campaign to save the environment—and its human inhabitants—from the blind assaults of modern technology."[161] Similarly, Kennedy celebrated the LTBT as much for its abolition of global fallout from the big three contributors, as for its contribution to significantly reducing world tension. Finalized amid the international popularity of *Silent Spring*, the LTBT was simultaneously the world's first international treaty on the control of nuclear weapons and world's first global agreement for environmental protection.[162]

In September 1963, after concluding negotiations for the LTBT, President John F. Kennedy addressed the UN General Assembly in New York, in what would be his final speech there. Kennedy celebrated the LTBT for helping create "an atmosphere of rising hope" and "a moment of comparative calm." The treaty, which by then had already earned signatures from nearly 100 nations, led Kennedy to celebrate how "people the world over … are thankful to be free from the fears of nuclear fallout." He described the LTBT as "a milestone – but it is not the millennium. We have not been released from our obligations – we have been given

[160] Wittner, *Resisting the Bomb,* 415-425; Zuoyue Wang, *In Sputnik's Shadow: The President's Science Advisory Committee and Cold War America* (New Brunswick, NJ: Rutgers University Press, 2008), 214-230.

[161] Commoner, *The Closing Circle* (New York: Knopf, 1971), 56.

an opportunity." Before the world's nations at the UN, Kennedy saw that opportunity as a global effort to safeguard the environment and work to eliminate "plunder and pollution, the hazards of nature, and the hunger of children." Having already helped secure protection against global fallout, Kennedy imagined "a worldwide program" organized through the UN to "protect the forest and wild game preserves now in danger of extinction for all time." The UN provided the ideal institution for these endeavors, he explained, because "The earth, the sea, and the air are the concern of every nation." Seeking to expand the success of the LTBT, Kennedy made a specific demand "to prevent the contamination of air and water by industrial as well as nuclear pollution."[163]

But nine weeks later, Kennedy was killed and his vision to protect the global environment against industrial pollution faded within the UN. It would take the UN nearly a decade before its members would formally meet in Stockholm to address the world's ongoing environmental challenges and threats. In the meantime, however, a powerful environmental advocacy movement spread throughout the industrialized world, especially in the United States, which built upon the lessons of atomic fallout and *Silent Spring* to encompass a planetary perspective on the health and future survival of Spaceship Earth's global environment.

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[162] John McCormick, *The Global Environmental Movement*, Second Edition (New York: John Wiley & Sons, 1995), 64.

[163] John F. Kennedy, "Address Before the 18th General Assembly of the United Nations," September 20, 1963, http://www.presidency.ucsb.edu/ws/?pid=9416, accessed December 21, 2013.

Explosions of Environmental Concern

In the wake of the LTBT, many of the same actors, ideas, and actions involved in advocating against nuclear weapons testing in the 1950s and early 1960s transitioned from fallout to address other environmental threats. In 1963, Barry Commoner and zoologist E.W. Pfeiffer, who both led scientists' efforts against atomic testing, founded the Scientists' Institute for Public Information (SIPI) to continue and expand their efforts at informing the public on scientific issues and dangers. Barry Commoner, for instance, expanded his focus on fallout to embrace a host of newly realized environmental hazards. In his popular book from 1963, *Science and Survival*, Commoner wrote, "The new hazards are neither local nor brief. Air pollution covers vast areas. Fallout is worldwide. Synthetic chemicals remain in the soil for years. Radioactive pollutants now on the earth's surface will be found there for generations. … Excess carbon dioxide from fuel combustion eventually might cause floods that could cover much of the earth's present land surface for centuries."[164]

By 1964, Commoner was arguing that fallout and water pollution presented very similar cases. That same year, his St. Louis Committee on Nuclear Information changed its name to the Committee on Environmental Information. In 1964, the SIPI board voted to include public information programs on the effects of the large-scale use of pesticides and herbicides, as well as programs on air and water pollution, in addition to its already existent programs on nuclear radiation. The SIPI board's policy statement warned how the hazards of nuclear radiation and the "general

contamination of the environment reflect a deep seated problem regarding the social effects of modern science and technology." Of great concern for these now ecologically concerned scientists was the "tendency of the growing power of science to be used in large-scale technological applications without adequate scientific knowledge of their eventual effect on the capability of the environment to support society."[165] To better explore the biological implications of humanity's environmental intrusions, Commoner founded in 1966 the Center for the Biology of Natural Systems with a $4.5 million grant from the Public Health Service. Before the end of the decade, Commoner's shift to environmental advocacy made him known internationally as a leading authority on the ecological challenges posed by polluting industrial technologies and economic development, which he eventually castigated as the leading causes of a growing global environmental crisis.[166]

Other concerned scientists, with different environmental concerns, joined the fray. In January 1965, a charismatic biologist at Stanford University named Paul R. Ehrlich, who's specialization was butterflies, gave his first public address on environmental challenges, which first outlined publically his dire concerns about global population growth. Ehrlich's speech, titled "The Biological Revolution," was inspired by Rachel Carson's remarkable success where other scientists had failed: making environmental issues a widespread public concern. Carson had done so by publishing a popular book that ignited public activism and produced policy changes

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[164] Barry Commoner, *Science and Survival* (New York: Viking Press, 1966, c1963), 28.
[165] E.L. Tatum, "Information Programs about Environmental Contamination," *Science*, 144:3619 (May 8, 1964), 616.

on ways pesticides were regulated. Biologists, Ehrlich encouraged, "must come out of our ivory towers and take an active part in the political life of our society. Following Rachel Carson's lead, we must fight abuses where they occur." Seeking similar public engagement and influence for his own concerns about population growth, Ehrlich's speech addressed the need for biologists to reshape public policy with their special knowledge and ensure the long-term survival of humanity against escalating environmental degradation.[167]

Also clearly influenced by the worldwide movement against atomic bombs and fallout, Ehrlich advised against the growth of certain new technologies, namely nuclear weapons, which had given humans "the means for self-extermination." But it was Ehrlich's biological worldview that inspired his warning against overpopulation. If human populations continued at their accelerating rate to modify nature, dominate other species, and increase their numbers, than humans, just like all other species whose populations outgrow their environments, would suffer inevitable die-offs. Ehrlich argued that, without major changes to human reproduction patters and better treatment of Earth's interconnected ecologies, humanity would soon crash against nature's finite limits with "disastrous consequences." This speech, which contained

[166] Rae Goodell, *The Visible Scientists* (Boston: Little, Brown, and Co., 1977), 60-69; Michael Egan, *Barry Commoner and the Science of Survival: the Remaking of American Environmentalism* (Cambridge, MA: MIT Press, 2007).

[167] Paul Ehrlich, "The Biological Revolution," January 31, 1965, cited in Thomas Robertson, *The Malthusian Moment: Global Population Growth and the Birth of American Environmentalism* (New Brunswich, NJ: Rutgers University Press, 2012), 135-137. For more extensive analysis, see Thomas Robertson, "The Population Bomb: Population Growth, Globalization, and American Environmentalism, 1945-1980," (Ph.D. diss., University of Wisconsin-Madison, 2005), 148-150.

the seeds of forceful arguments Ehrlich would soon make famous, launched his career as a public environmental activist.[168]

Months after calling for "Biological Revolution," in the summer of 1965, Ehrlich left for a year of research and travel across the globe. His international expedition for butterflies brought him to parts of East Africa, Asia, and the South Pacific, including visits in Australia, New Guinea, Malaysia, Thailand, Cambodia, and India. While expecting to find tropical paradises, instead he found extreme poverty, environmental devastation, and clear signs of failed efforts of American modernization and development projects abroad. In particular, the seething crowds in India, which at that time was suffering a dire food crisis, made a drastic impression on Ehrlich as to the dangers of overpopulation. Viewed through a biological lens, Ehrlich became increasingly convinced that too many people created environmental degradation, social instability, and conflicts for limited resources that could easily erupt into war. Given the new realities of nuclear weapons and their catastrophic consequences for threatening all life on planet Earth, Erhlich came to see the worldwide population as a ticking planetary time bomb.[169]

Upon his return to Stanford at the end of 1966, Ehrlich escalated his public advocacy on the environmental and social dangers of global overpopulation. Ehrlich scheduled more occasions to deliver public addresses, to which he introduced his harrowing experiences in India. In the process, he grew increasingly convinced that global catastrophe lay only a few years over the horizon. He felt even greater

[168] Ibid.
[169] Thomas Robertson, *The Malthusian Moment: Global Population Growth and the Birth of American Environmentalism* (New Brunswich, NJ: Rutgers University Press, 2012), 137-138.

urgency in 1967 after reading *Famine 1975!* by William and Paul Paddock. Their book used a host of new statistics and modern documentation to expand globally the revitalized Malthusian argument that, no matter the technological solutions attempted, food supplies would soon outpace growing human demands, resulting in inevitable famine with disastrous political consequences. As with Ehrlich's personal experiences, the growing numbers of people in India played a major role in their argument.[170]

By April 1967, Ehrlich told the Commonwealth Club in San Francisco, "During the past year it had become shockingly apparent that the battle to feed humanity is being lost."[171] Here lay the origins of what became Ehrlich's own bestselling book, *The Population Bomb,* which he published in 1968. Yet, when Ehrlich published that book in 1968, he opened with a slight revision of his earlier admonitions to definitively prophesize a dire future: "The battle to feed all of humanity is over," he said; it was no longer merely being lost.[172] Such fiery rhetoric of impending doom from a leading ecologist brought widespread concern, especially in the United States, about the possible collapse of global environmental systems.

Ehrlich's fame as a biologist had come from his insight in 1964 of "coevolution," where organisms—in his case, butterflies and plants—evolved in relationship to each other. Coevolution became an important contribution to

[170] William Paddock and Paul Paddock, *Famine 1975!* (Boston: Little, Brown, 1967). See Thomas Robertson, *The Malthusian Moment: Global Population Growth and the Birth of American Environmentalism* (New Brunswich, NJ: Rutgers University Press, 2012), 138.

[171] Ehrlich quoted in Thomas Robertson, "The Population Bomb: Population Growth, Globalization, and American Environmentalism, 1945-1980," (Ph.D. diss., University of Wisconsin-Madison, 2005), 152.

[172] Paul R. Ehrlich, *The Population Bomb*, (New York: Ballantine Books and the Sierra Club, 1968), 1.

evolutionary and ecological theory. This powerful concept about the vital bonds between living things shaped Ehrlich's concerns about the global growth of environmentally abusive human populations because, with mutual dependence in the single web of life, destruction one place threatened the entire system.[173] Ehrlich's world tour for butterfly research in 1965 provided him an opportunity to examine Third World poverty, overpopulation, and environmental deterioration on a global scale. Over the next several years, Ehrlich's immensely popular publications and public addresses, most of them co-written with his wife Ann, earned him both fame and growing opportunities influence his fellow passengers traveling on an environmentally imperiled Spaceship Earth.

Indeed, it was during this time in the mid-1960s, and in the context of new conceptions about our worldwide ecological interconnections, that the symbol of Spaceship Earth emerged. In 1965, Adlai Stevenson introduced the UN to his notion that we all journey together on our fragile planetary spaceship. Stevenson, however, was not the only one at that time integrating scientific concepts about systems to make bold recommendations on how to best manage the planet. That same year, in 1965, Kenneth Boulding and Barbara Ward—both economists with strong sensitivities to the interdependencies of global systems—separately sounded alarms about the need for whole-Earth thinking to ensure humanity's future survival on Spaceship Earth.

[173] Paul R. Ehrlich and Peter Raven, "Butterflies and Plants: A Study in Coevolution," *Evolution* 18 (1964), 586-608. See also, Paul R. Ehrlich, *The Machinery of Nature* (New York: Simon & Schuster, 1986), 145-146.

In May 1965, Boulding delivered a brief lecture titled "Earth as a Space Ship." Just weeks before Stevenson's speech in Geneva to the UN ECOSOC Council, Boulding described to a small academic committee in Washington state how the conceptual and technological successes of systems thinking over the prior two decades, and new realizations about our ecological interconnections, combined to reorder humanity's perception of itself, as well as its place in the world. Along similar lines of thought as Adlai Stevenson, Boulding declared "Earth has become a space ship, not only in our imagination but also in the hard realities of the social, biological, and physical system in which man is enmeshed." Although Boulding's academic expertise lay in economics, his advocacy of a systems thinking and growing realizations about global environmental hazards spurred his belief that, if humanity was to survive on Spaceship Earth, "Man is finally going to have to face the fact that he is a biological system living in an ecological system, and that his survival power is going to depend on his developing symbiotic relationships of a closed-cycle character with all the other elements and populations of the world of ecological systems." Boulding proclaimed that preserving the integrity of Earth's essential ecological systems would require profound changes to humanity's social behaviors and its governing political systems. As a life-long pacifist and given his new realizations of Earth as a spaceship, Boulding concluded that "We cannot afford unrestrained conflict, and we almost certainly cannot afford national sovereignty in an unrestricted sense." Instead, Boulding suggested a systems solution and called for rapid establishment of "cybernetic or homeostatic mechanisms" for planetary politics

and the global economy to ensure the long-term survival of humankind on Earth.[174] Whether he knew it or not, Boulding had laid the battlegrounds of political debates for the global environmental moment that played out over the next several years in the journey toward Stockholm.

Later, in the fall of 1965, British economist and Columbia University professor Barbara Ward delivered a series of lectures, later published as a book she titled, *Spaceship Earth.* Ward's lectures, written during her residential fellowship at Brookhaven National Laboratories in New York, appraised the impact of modern science on society, which she framed in the context of unitary systems. "In our world today," she began, "all the irresistible forces of technological and scientific change are creating a single, vulnerable, human community." Modern science and technology, she announced "have created so close a network of communication, transport, economic interdependence—and potential nuclear destruction—that planet Earth, on its journey through infinity, has acquired the intimacy, the fellowship, and the vulnerability of a spaceship." In short, for international development economist Barbara Ward, the colliding impetuses of the modern world meant Spaceship Earth needed much better care if humanity hoped to survive their shared journey together.[175]

Ward reached conclusions similar to fellow economist Kenneth Boulding and to her good friend Adlai Stevenson. Given the global interdependences and the

[174] Kenneth E. Boulding, "Earth as a Spaceship," May 10, 1965, Washington State University Committee on Space Sciences, Box 38, Kenneth E. Boulding Papers, University of Colorado at Boulder Libraries, reprinted at http://www.quakerinstitute.org/?page_id=482, accessed October 14, 2013.

[175] Barbara Ward, *Spaceship Earth* (New York: Columbia University Press, 1966), 1, vi.

planetary-scale threats now possible with humanity's technological power—including the threats of nuclear technology, the chemical applications in modern agriculture, and the increasing pollution from industrial production—Barbara Ward believed the only hope for humanity's survival on Spaceship Earth demanded a new global politics focused on "restoring a reasonable balance of power between continents, a reasonable balance of wealth between the planet's developed North and underdeveloped South, a reasonable balance of understanding and tolerance between the world's rival creeds." The realization that Spaceship Earth, and everything and everyone on it, functioned collectively as a unified system of systems meant that humanity had reached "a planetary point of no return." Humanity's best hope, according to Ward and other whole-Earth thinkers, seemed to be a better global balance and equilibrium of Earth's various ecological, economic, and especially its political systems. Global environmental politics found its initial imagery in the symbol of Spaceship Earth.[176]

The next spring, in March 1966, Kenneth Boulding further expanded on the economic and environmental consequences of the new science-based planetary consciousness. Boulding elaborated his ideas in a talk titled, "The Economics of the Coming Spaceship Earth," delivered to a forum on "Environmental Quality in a Growing Economy," hosted by Resources for the Future in Washington D.C. Boulding built upon the new appreciation that human technology's global reach, and its accompanying systems concepts, had rendered the Earth as a closed system. Such global systems approach called into question the traditional measures of success,

[176] Barbara Ward, *Spaceship Earth* (New York: Columbia University Press, 1966), viii, 15.

especially in terms of economics. Boulding believed that, for the most part, economists had "failed to come to grips with the ultimate consequences of the transition from the open to the closed earth."[177] For millennia, humans had followed a pattern of continual expansion into new frontiers with general disregard for the use or waste of natural resources.[178] Boulding described such practices as the "cowboy economy," and he associated its exploitation of natural resources "with reckless, exploitative, romantic, and violent behavior."[179] Cowboy economics, the standard economic ideology across most of the globe, remained possible only with the continued existence of new frontiers to expand into, with new resources to exploit and exhaust. However, humanity's global dominance and the new perception of Earth as unitary and closed, both ecologically and economically, produced a new understanding of Earth's limits. Such limitations, Boulding believed, would eventually demand a new global economic order that worked within Earth's closed, ecological bounds. Failure to integrate humanity's "econosphere" within Earth's limited biosphere, Boulding argued, would produce catastrophe for both.

In contrast to the destructive cowboy economy, Boulding called for a transition to what he described as a "spaceman economy, in which the earth has

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[177] Kenneth E. Boulding, "The Economics of the Coming Spaceship Earth," in *Environmental Quality in a Growing Economy, Essays from the Sixth RFF Forum*, edited by Henry Jarrett (Baltimore: Johns Hopkins University Press for Resources for the Future, Inc., 1966), 3-14, reprinted in Kenneth E. Boulding, *Beyond Economics: Essays on Society, Religion, and Ethics* (Ann Arbor: University of Michigan Press, 1968), 275-287, quote on 276.

[178] Edward B. Barbier, *Scarcity and Frontiers: How Economies Have Developed Through Natural Resource Exploitation* (New York: Cambridge University Press, 2011).

[179] Kenneth E. Boulding, "The Economics of the Coming Spaceship Earth," in *Environmental Quality in a Growing Economy, Essays from the Sixth RFF Forum*, edited by Henry Jarrett (Baltimore: Johns Hopkins University Press for Resources for the Future, Inc., 1966), 3-14, reprinted in Kenneth E. Boulding, *Beyond Economics: Essays on Society, Religion, and Ethics* (Ann Arbor: University of Michigan Press, 1968), 275-287, quote on 281.

become a single spaceship, without unlimited reservoirs of anything, either for extraction or for pollution, and in which, therefore, man must find his place in a cyclical ecological system." In the spaceman economy, industrial production and consumption would be "minimized rather than maximized," and the measures of success moved beyond economics to include and cultivate "the state of the human bodies and minds included in the system."[180] In short, Boulding had proposed an entirely new mode of action and integration, quite different from the traditional models of economic development and continual growth.

For economists like himself, Boulding acknowledged how the "idea that both production and consumption are bad things rather than good things is very strange." But failure to appreciate the new economics of Spaceship Earth had already produced problems approaching planetary proportions. Boulding offered a growing toll of cowboy-created pollution: "Los Angeles has run out of air, Lake Erie has become a cesspool, the oceans are getting full of lead and DDT, and the atmosphere may become man's major problem in another generation, at the rate at which we are filling it up with gunk." He warned that the "fouling of the nest which has been typical of man's activity in the past on a local scale now seems to be extending to the whole world society."[181] Survival on Spaceship Earth, Boulding concluded, required systematic changes of planetary scale.

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[180] Ibid.

[181] Kenneth E. Boulding, "The Economics of the Coming Spaceship Earth," in *Environmental Quality in a Growing Economy, Essays from the Sixth RFF Forum*, edited by Henry Jarrett (Baltimore: Johns Hopkins University Press for Resources for the Future, Inc., 1966), 3-14, reprinted

With increased awareness of planetary interconnection and new attention to various threats on the sustainability of modern life, passengers on Spaceship Earth entered what I call the global environmental moment. The global environmental moment of the late 1960s and early 1970s was born from visions of the whole world as a vast yet singular network of systems, seeing Earth as a fragile spaceship dependent on wise use of its limited resources and attentive to protecting—not destroying—its life-sustaining environments. This profound environmental vision found newfound meaning and encouragement for drastic international action, especially in the wake of awareness from global atomic fallout, the heedless spread of chemical toxins, possible catastrophe from overpopulation, the unchecked exploitation of Earth's natural capital from economic development, and the apparent attainment of ecological endpoints for absorbing humanity's apparent disavowal of it biological limits. At the end of the 1960s and into the early 1970s, as the ensuing chapters address, many of the world's industrialized nations demanded intergovernmental action to confront these global environmental challenges, which induced both conflict and collaboration as they moved toward the environmental circus in Stockholm.

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in Kenneth E. Boulding, *Beyond Economics: Essays on Society, Religion, and Ethics* (Ann Arbor: University of Michigan Press, 1968), 275-287, quotes on 281, 282, 285.

Chapter 3

ENVIRONMENTAL REVOLUTIONS:
Industrialized Nations and Global Crisis

"We are building a movement … a movement that values people more than technology, people more than political boundaries and political ideologies, people more than profit."

— Dennis Hayes, national coordinator of the first Earth Day, April 1970.

"If anything very constructive is going to be accomplished along this line [of global environmental protection], the interest and initiative will have to proceed from a relatively small group of governments… The devastation of the environment is primarily, though not exclusively, a function of advanced industrial and urban society. The correction of it is primarily a problem for the advanced nations."

— George F. Kennan, "To Prevent a World Wasteland," April 1970.

For many people around the world, the year 1968 was one that "rocked the world."[182] Especially for youth, 1968 resounded with hopeful expectations of progressive social change through transformational politics. Widespread international opposition to U.S. escalation of the Vietnam War contributed significantly to social movements on many continents. To the many youth involved in those social protests, revolutionary change felt near at hand. In 1968, dissident student and counterculture uprisings against disparate forms of cultural and political authoritarianism exploded around the world, in France, Mexico, and Nigeria; in Czechoslovakia, Cuba, and West Germany; in the United States, Poland, and

[182] Mark Kurlansky, *1968: The Year That Rocked the World* (New York: Ballantine Books, 2004).

elsewhere. While such clamoring for change felt exciting for some, for others, 1968 induced a foreboding sense of insecurity.[183]

The year opened violently in Vietnam with the Tet Offensive, and disorder reverberated throughout the year and around the world in brutal street clashes and assassinations of beloved world figures, including Martin Luther King, Jr. Also in 1968, Paul Ehrlich's best-selling screed against overpopulation, *The Population Bomb*, first arrived in bookstores and flew off their shelves. Prophesying doom, Ehrlich warned readers that, "In the 1970s, hundreds of millions of people will starve to death in spite of any crash programs embarked upon now."[184] Increasing human demands appeared to overuse and abuse nature with projections of dire consequences. Polluting industrial technologies, overpopulation, and poisonous chemicals increasingly despoiled the world's interconnected environment. If such devastation and loss of resources continued, Spaceship Earth might move beyond limited hostilities toward worldwide war. Humanity may have narrowly survived the Cold War's Cuban Missile Crisis, but with a new and very hot war then raging in the jungles of Indochina, social upheaval on the streets across the world, and a ticking population bomb ready to blow, was Spaceship Earth in 1968 bound for catastrophe?

By the late 1960s, the global environmental moment commenced with escalating anxiety—especially in industrialized nations of the global North—that the

[183] Recent analyses of 1968 include Phillip Gassert and Martin Klimke, eds., "1968: Memories and Legacies of a Global Revolt," *Bulletin of the German Historical Institute*, Supplement 6 (2009), 1-240; Karen Dubinsky, Susan Lord, Sean Mills, and Scott Rutherford, eds., *New World Coming: The Sixties and the Shaping of Global Consciousness* (Toronto: Between the Lines, 2009); and "The International 1968, Part I & Part II," *American Historical Review* 114, No. 1 (February 2009): 42-135, and No. 2 (April 2009): 329-404.

[184] Ehrlich, *Population Bomb*, 1.

interconnected ecological, technological, social, and economic systems of Spaceship Earth needed serious alterations to avoid systemic collapse. Over the next several years, various political reactions to these planetary concerns fabricated the structures of modern international environmental politics. This chapter explains how leading environmental scientists and experts from the global North, influential world leaders of industrialized nations, as well as millions of citizens initially questioned once-sacred impulses for unrestrained economic development amid new environmental awareness. Continued warnings by ecological scientists and advocates about the environmental dangers of economic development encouraged government diplomats in Europe, the United States, and Japan to propose new domestic and international institutions for correcting widespread environmental degradation, including plans for the United Nations (UN) to convene a worldwide conference on global environmental issues. Reactions to environmental apprehensions in the global North inspired various visions for the form and content of environmental institutions to revise the structures of development, with limited desire for participation from less developed countries (LDCs) of the global South, but little initial consideration of their perspectives. This chapter reveals how, from 1968 through 1970, an apparent environmental revolution first unfolded in the world's industrialized powerhouses, particularly the United States and Japan, which steered Spaceship Earth into the global environmental moment with indications of radical alterations to the international economic order.

Ecological Experts Assess Economic Development

To avert what appeared to be a looming environmental catastrophe, Sweden's foreign ministers put forward an idea for global conference. Just before 1968 dawned, in December 1967, Swedish diplomats Inga Thorssen and Börje Billne informally suggested that the UN, instead of hosting what they perceived as another wasteful conference on the peaceful uses of nuclear energy, should rather hold an intergovernmental conference on the manifold challenges for the human environment. Throughout 1968, the idea for a United Nations Conference on the Human Environment (UNCHE) percolated within the UN's institutional machinery. After further consideration within the Swedish government, its representatives again raised the issue in May 1968. This time, Sweden prepared a formal and persuasive memorandum on the gravity of environmental problems to the 45th session of the UN Economic and Social Council (ECOSOC), the forum in Geneva where UN members addressed prominent issues of social and economic concern before those issues moved to the UN General Assembly in New York.[185]

It was only a few years earlier, in 1965 that American ambassador to the UN, Adlai Stevenson, famously told the ECOSOC that "We travel *together*, passengers on a little space ship, *dependent* on its *vulnerable* reserves of air and soil; all committed for our safety to its security and peace; preserved from annihilation only

[185] Maria Ivanova, "Environment: The Path of Global Environmental Governance – Form and Function in Historical Perspective," in *Governance for Sustainable Development: A Foundation for the Future*, edited by Rosalie Callway (New York: Routledge, 2013), 45-68. See also, Sverker Åström, *Ögonblick: Från Ett Halvsekel I Ud-Tjänst [Moments: From Half a Century of Foreign Affairs]* (Stockholm: Lind & Co., 2003, c1992).

by the care, the work, and I will say, the love we give our fragile craft."[186] In July 1968, to protect Spaceship Earth from annihilation, ECOSOC Resolution 1346 (XLV) recommended that, indeed, the UN should host an intergovernmental environmental conference. It should provide a forum where governments and international organizations could debate how best to "limit and, where possible, to eliminate the impairment of the human environment."[187] Further discussion on what came to be known as "the Swedish matter" awaited debate in the UN General Assembly, which would meet toward the end of 1968.

Before that debate, however, the UN Educational, Scientific, and Cultural Organization (UNESCO) would host its planned Intergovernmental Conference of Experts on the Scientific Basis for the Rational Use and Conservation of the Resources of the Biosphere, otherwise known as the Biosphere Conference. UNESCO's Biosphere Conference was, of course, not the first group of experts to address issues of environmental protection, conservation, and natural resource use. Just two years earlier, in 1966, Kenneth Boulding had told a forum on "Environmental Quality in a Growing Economy" that planetary pollution and reckless resource use in the current consumptive "cowboy economy" would soon require creation of a "closed" or stable-state "spaceman economy."[188] Henry Jarrett,

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[186] Adlai Stevenson, "Strengthening the International Development Institutions," July 9, 1965, in *The Papers of Adlai E. Stevenson, Vol. VIII: Ambassador to t.he United Nations, 1961-1965*, edited by Walter Johnson (Boston: Little, Brown, and Company, 1979), 814-828, quote on 828, emphasis in Stevenson's original typewritten copy.

[187] Quoted in Ivanova, "Environment," 49.

[188] Kenneth E. Boulding, "The Economics of the Coming Spaceship Earth," reprinted in Kenneth E. Boulding, *Beyond Economics: Essays on Society, Religion, and Ethics* (Ann Arbor: University of Michigan Press, 1968), 275-287, here 281. For additional speeches and analysis, see Henry Jarrett, ed., *Environmental Quality in a Growing Economy, Essays from the Sixth RFF Forum* (Baltimore: Johns Hopkins University Press for Resources for the Future, Inc., 1966).

chairman of that forum concluded that, "if national and world problems continue to increase at anything like present rates, it is only a question of time until pressures upon both environmental quality and supplies of natural resource products become intolerable."[189] Two short years later, UNESCO's Biosphere Conference met to address humanity's growing impact on the interconnected biosphere and to discuss the most rational use and conservation of Spaceship Earth's limited resources.

The Biosphere Conference, held in Paris from September 4-13, 1968 gathered more than 300 delegates from sixty countries who worked in various fields in science, management, and diplomacy. Organized by Frenchman Michel Batisse, the conference featured active participation from various UN agencies, including its host agency, UNESCO, the Food and Agriculture Organization (FAO), and the World Health Organization (WHO). The conference also included cooperation from international non-governmental organizations like the International Union for Conservation of Nature (IUCN) and the International Council of Science's International Biological Program (IBP). After nine days of meetings, UNESCO's conference of experts produced twenty recommendations that combined their hopes and fears on the "Rational Use and Conservation in Assistance Projects for Developing Nations."[190] If enacted, their conclusions, especially those related to economic development, carried implications both for the global North and for the world's LDCs.

[189] Jarrett, *Environmental Quality in a Growing Economy,* vii.

[190] UNESCO, *Intergovernmental Conference of Experts on the Scientific Basis for the Rational Use and Conservation of the Resources of the Biosphere: Recommendations*, UNESCO House, September 4-13, 1968, Carnegie Mellon University Digital Collections.

One recommendation included unanimous encouragement for the UN General Assembly to support the international conference suggested by Sweden in the ECOSOC. The Biosphere experts expressed their hope that the proposed UN conference could create "a Universal Declaration on the Protection and Betterment of the Human Environment," similar to the UN's Universal Declaration on Human Rights.[191] Although the experts recognized that human-induced environmental changes had taken place throughout human history, they warned that impact on the biosphere had recently reached a critical threshold and required collaborative correction involving all nations. Their realization of an interconnected biosphere shaped their belief that current and careless means of economic development must be changed.

The UNESCO experts' final recommendations challenged the status quo of economic growth, given its recently realized effect on the environment. Although they recognized, on one hand, the desires of LDCs to confront demographic and environmental challenges with traditional economic development, the experts admitted "fearing, on the other hand, that intensive exploitation of the natural resources of these [developing] countries, and the necessary developments of industrialization could cause irreversible perturbations in an environment which is still little disturbed and whose balance is fragile." As such, the conference recommended that "ecological interactions should duly be taken into account in all large-scale development projects." The experts' final recommendation thus called

[191] UNESCO, *Intergovernmental Conference of Experts on the Scientific Basis for the Rational Use and Conservation of the Resources of the Biosphere: Recommendations*, UNESCO House, September 4-13, 1968, Carnegie Mellon University Digital Collections, quote on 24.

for global coordination of economic development and for "the rational utilization and conservation of resources of the biosphere … for the good of mankind."[192] At the end of the 1960s, in what the UN had previously declared as its first Development Decade, environmental concern over the effects of economic development increasingly became a topic of international debate among leading ecologists and economists.

By December 1968, momentum had gathered for international action on environmental degradation and reconsideration of traditional patterns of economic development. On December 3, 1968, the UN General Assembly in New York passed Resolution 2398 (XXIII), "Problems of the Human Environment," which decided definitively to convene the UNCHE in 1972. In recognition of "grave dangers" posed by modern scientific and technological developments, the UN General Assembly was "convinced that increased attention to the problems of the human environment is essential for sound economic and social development." In anticipation of the 1972 UNCHE, the General Assembly requested the ECOSOC provide a background report on global environmental problems. And it expressed "strong hope" that relatively poorer LDCs would benefit from international cooperation and scientific expertise from the wealthy industrialized nations, as they all began to combat environmental problems. While the resolution recognized LDC interest in mobilizing environmental knowledge and experience from industrialized

[192] UNESCO, *Intergovernmental Conference of Experts*, 26-28.

nations, concern about the essential role and value of development in light of ecological threats continued to mount.[193]

Days after the UN decision to convene the UNCHE, another meeting of international experts gathered from December 8-11, 1968 at Airlie House outside of Washington D.C. They met to investigate the ecological costs of introducing industrial technology into LDCs and to assess holistically the consequences of international development. The 1968 Airlie House Conference on the Ecological Aspects of International Development was sponsored jointly by the Conservation Foundation—then headed by Russell E. Train, fated the next month to become President Nixon's chairman of the first U.S. Council on Environmental Quality (CEQ)—and by the Center for the Biology of Natural Systems at Washington University in St. Louis, Missouri—the research center founded and directed by biologist and environmental activist, Barry Commoner. Additional world-renowned environmental experts attending the Airlie House conference included IUCN ecologist and UN consultant, Raymond F. Dasmann; Smithsonian ecologist and UNESCO consultant, Lee Talbot; and organizer of UNESCO's Biosphere Conference, Michel Batisse, among many others. They joined international development experts, including Kenneth Boulding and Swedish economist Gunnar Myrdal, to examine specific case studies of development-led technological intrusions into various LDC environments, from Southeast Asia to East Africa, from Latin America to the Middle East, and from the Southern Mediterranean to the Indus Valley.

[193] UN General Assembly resolution 2398 (XXIII) "Problems of the human environment,"

The proceedings of the 1968 Airlie House conference—edited by Barry Commoner's Iranian graduate student, M. Taghi Farvar, and John P. Milton, director of International Programs for the Conservation Foundation—challenged "the very validity of the values, goals, and methods of development." With numerous case studies, the conference presentations indicated that "the bulk of international development to date has often been destructive," and that "the environmental side effects of technology are often even more serious in the less-developed than in the developed countries." Example upon example of unplanned "ecological backlash" led to Barry Commoner's appraisal—which he titled, "On the Meaning of Ecological Failures in International Development"— that "these widespread ecological mistakes are not the random accidents of progress, but rather the systematic consequences of some deep fault in our approach to technological development."[194] The various systems entwined in economic development and technological intrusions, Commoner proposed, were the primary contributors to environmental destruction around the world. Having helped confront dangers of nuclear testing earlier in the decade, Commoner's new mission became attacking the un-ecological systems of development previously associated with the colonialism but continued, in his eyes, under a new guise of global economic development.

Economist Gunnar Myrdal, an international development scholar, announced that the conference presentations and discussions afforded him "a new education in

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December 3, 1968.

[194] M. Taghi Farvar and John P. Milton, eds., *The Careless Technology: Ecology and International Development*, *Record of the Conference on the Ecological Aspects of International Development Convened by The Conservation Foundation and the Center for the Biology of Natural*

the historical narrowness of development economics." Now thinking ecologically, Myrdal realized that development "implies disequilibrium," yet the "ideal must be to have it in dynamic balance. In other words, we need to have as much equilibrium as we can have." Economist Kenneth Boulding concurred. "All these ecological horror stories," Boulding announced, "have important lessons that I hope will plug into the international development process." Half-joking, Boulding suggested an appropriate title for the conference volume might be, "*Developmental Horror Stories or, Is Man a Fugitive Species?*"[195] The conference's barrage of negative case studies indicated that the ideology of progress, both in terms of science and development, must be questioned and reoriented. In essence, these experts—like those earlier at the UNESCO Biosphere Conference—called for a worldwide environmental revolution to revise the traditional patterns of economic growth along more ecological lines of balance and stability.

Attendees to the Airlie House conference concluded that private industry and international agencies had been "negligent in guiding the development and application of man's tools." Those responsible for international economic improvement projects, they determined, could no longer afford to ignore the ecological problems of development. New ecological awareness called for "a fundamental re-evaluation of global environmental relationships and to the

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Systems, *December 8-11, 1968, Airlie House, Warrenton, Virginia* (Garden City, NY: The Natural History Press, 1972), xiii, xxi.

[195] M. Taghi Farvar and John P. Milton, eds., *The Careless Technology: Ecology and International Development*, *Record of the Conference on the Ecological Aspects of International Development Convened by The Conservation Foundation and the Center for the Biology of Natural Systems*, *December 8-11, 1968, Airlie House, Warrenton, Virginia* (Garden City, NY: The Natural History Press, 1972), 146-147.

development of sound values and goals" by establishing "technology in equilibrium with the biosphere," similar to Kenneth Boulding's earlier call for a "spaceman economy." Lynton K. Caldwell—an American political scientist who soon drafted the pioneering U.S. National Environmental Policy Act (NEPA) of 1969—declared in his presentation that development "is hazardous, not only to ecological variety and stability in developing areas, but to the very objectives of development itself." Noting the inadequacy of existing institutions to cope with "a growing global crisis of the environment," Caldwell believed it necessary to "restructure the machinery of international technical assistance" to better steer Spaceship Earth. If the "analogy of the spaceship is valid," he concluded, then "a universal political order is needed … [with] institutions for world-wide environmental control." Along those lines, Caldwell highlighted happily both the recent Biosphere Conference and the UN's decision days earlier to convene the UNCHE in 1972. A representative from the UN who attended the Airlie House meeting promised to bring the conference's realizations back to those responsible for designing the scope and content of the proposed UNCHE.[196] While barely a glimmer of an idea, the UNCHE seemed destined for serious reappraisal of economic development in light of international evidence of its environmental damage—at least, if these environmental experts from the global North had their way with it.

Barry Commoner chaired the concluding Airlie House panel to assess the conference's revolutionary implications for international development programs. Frenchman Michel Batisse noted how the revolutionary French students in May

[196] Farvar and Milton, eds., *The Careless Technology*, xiii, xiv-xv, 934, 938, 940.

1968 had, like this conference, questioned the very value of development and whether it should even occur. On the issue of development, Raymond F. Dasmann, a senior ecologist with IUCN and consultant to the UN and UNESCO, suggested the need to "change our goal away from maximizing production and toward … improvement of the quality of life." M. Taghi Farvar, an Iranian who later completed his PhD with Commoner on the ecological implications of development in Central America, concluded that "the 'rope' we offer to the less-developed nations is rotten."[197] For Farvar and others, economic development, at least as commonly attempted by industrialized actors, seemed less a solution for LDC troubles and more an ecological trouble-maker.

In closing the conference, Barry Commoner gave the final words to Kenneth Boulding, who had become the conference's unofficial poet laureate. Boulding's benediction, titled "A Ballad of Ecological Awareness," summarized the Airlie House conference's lessons and warnings in a rather wooden but lighthearted poem that, nonetheless challenged the economic status quo for the sake of planetary survival:

> Ecological awareness leads to questioning of goals:
> This threatens the performance of some old established roles.
> So to raise the human species from the level of subsistence
> We have to overcome Covert Political Resistance.
> So we should be propagating, without shadow of apology,
> A Scientific Discipline of Poleconecology.
> …
> There are benefits, of course, which may be countable, but which
> Have a tendency to fall into the pockets of the rich,
> While the costs are apt to fall upon the shoulders of the poor.

[197] Farvar and Milton, eds., *The Careless Technology*, 961, 970. See also, Mohammed-Taghi Farvar, "Ecological Implications of Insect Control in Central America Agriculture, Public Health, and Development," (Ph.D. diss., Washington University in St. Louis, 1972).

So cost-benefit analysis is nearly always sure,
To justify the buildings of a solid concrete fact,
While the Ecologic Truth is left behind in the Abstract.
…
Development is fatal to the local and specific;
A single culture spreads from the Atlantic to Pacific.
So preserving every specimen of life is quite essential
If we're not to break the bank of evolutionary potential.
…
If it's just the noise of progress that is beating in our ears
We could look beyond the turbulence and soothe our gnawing fears.
Man is drowning in his own success, and hapless is his hope
If our science and technology is but a rotten rope.

Infinity is ended, and mankind is in a box;
The era of expanding man is running out of rocks;
A self-sustaining Spaceship Earth is shortly in the offing
And man must be its crew—or else the box will be his coffin![198]

For Boulding, Commoner, and many of the world's renowned environmental experts—almost all from nations in the industrialized North—the Airlie House conference in December 1968 suggested that the social, technological, and ecological systems of Spaceship Earth needed immediate planetary overhaul, or the human species might find itself extinct. If LDC voices remained unrepresented, ecologists' concerns and recommendations carried serious consequences for nations rich and poor.

Later that December, in the final days of 1968, the American Association for the Advancement of Science (AAAS) met for its annual meeting, that year in Dallas, Texas. Many participants in the recent Airlie House conference on ecology and international development attended the AAAS meeting, which itself featured several seminars addressing environmental anxieties. The AAAS's leading journal, *Science*,

[198] Kenneth E. Boulding, "The Ballad of Ecological Awareness," in Farvar and Milton, *The Careless Technology*, 3, 157, 371, 669, 793, 955.

had just published Garrett Hardin's "The Tragedy of the Commons," which suggested Spaceship Earth's survival required mutual coercion to limit once-sacred liberties, especially against the freedom to breed and to control the unrestrained exploitation of natural resources.[199] In Dallas, one AAAS panel with a standing-room only audience earned a frightful front-page review in the *New York Times*. Held just days after astronauts aboard Apollo 8 orbited the moon and snapped the first Earthrise photos from space, the article explained that, in several hours of presentations, "experts in environmental science warned today that 'unanticipated hazards' of spreading technology threatened man's existence." Barry Commoner, fresh from his revelations at Airlie House and a prominent figure at the AAAS meeting, announced in Dallas that unless humanity inaugurated major changes to socio-technical systems at a global scale, "we run the risk of destroying this planet as a suitable place for human habitation."[200] When science fiction author Arthur C. Clarke wrote that "the world that existed before Christmas 1968 has passed away as irrevocably as the Earth-centered universe of the Middle Ages," he spoke not only of humanity's new place among the stars, but of a new consciousness for its survival back on Earth.[201] With the power of new technologies sending humans beyond the biosphere, what would life on Earth look like in the near future? Was humanity's technological and economic development really destroying the life-support systems for passengers on Spaceship Earth?

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[199] Garrett Hardin, "The Tragedy of the Commons," *Science* 162:3859 (December 13, 1968), 1243-1248.

[200] Robert Reinhold, "Panel Finds Danger to the Environment from Technology," *New York Times*, December 29, 1968, 1.

The *New York Times* began 1969 with three visions of the future framed by the new planetary consciousness. Zbigniew Brzezinski, a Polish-born professor of government and communist affairs, foresaw a speculative search for meaning as humanity moved toward a technetronic—or post-industrial—society. Glenn T. Seaborg, a Nobel-winning nuclear chemist and chairman of the U.S. Atomic Energy Commission, offered optimistic fables of technological prowess and staid overtures of affordable, endless energy amid other visions of technological achievement.[202] René Dubos, however, wondered "Is This Progress … or Self-Destruction?" Alongside images of industrial complexes spewing pollutants, the French-born microbiologist and director Environmental Biomedicine at Rockefeller University cited Spaceship Earth's "limitations" and warned that "unless we act drastically, and very soon," humanity risked self-annihilation "resulting from life in a closed environment which is every day more crowded, polluted, depleted and desecrated." Dubos painted harrowing portraits of industrial "progress" producing environmental poisoning. Previously localized, such desecration, he intoned, "now affects the whole earth." "Despite past achievements and promises for the near-future," Dubos prophesized an era of environmental doom unless humanity ended its "biological warfare against nature."[203] In the wake of Apollo 8 and continued warnings by his

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[201] Arthur C. Clark quoted in Robert Poole, *Earthrise: How Man First Saw the Earth* (New Haven, CT: Yale University Press, 2008), 5-6.

[202] Zbigniew Brzezinski, "The Search for Meaning Amid Change," *New York Times*, January 6, 1969, 141; Glenn T. Seaborg, "Uneasy World Gains Power Over Destiny," *New York Times*, January 6, 1969, 141. For the role of technological visions in the promotion and production of science and engineering practices, see W. Patrick McCray, *The Visionneers: How a Group of Elite Scientists Pursued Space Colonies, Nanotechnologies, and a Limitless Future* (Princeton: Princeton University Press, 2012).

[203] René Dubos, "Is This Progress … or Self Destruction?" *New York Times*, January 6, 1969, 142.

fellow environmental scientists, Dubos summoned the symbol of Spaceship Earth as an imperiled and closed system. Here again, an environmentalist from the global North called for total overhaul of global systems to ensure its survival.

Also in January 1969, American conservationist David Brower performed a final act of defiance before his firing as director of the Sierra Club and his founding of Friends of the Earth. Eschewing proper approval, Brower used Sierra Club funds to purchase a two-page display advertisement advancing the "urgent idea … before it's too late," to preserve the entire planet as an "Earth National Park." For his part, Brower imagined Spaceship Earth "as a kind of conservation district within the Universe; a wildlife preserve of sort, except we are the wildlife, together with all other life and environmental conditions that are necessary constituents of our survival and happiness." Emphasizing the "need to think of the organic wholeness of nature, not man apart from that," Brower encouraged American readers to write newly inaugurated President Richard Nixon about the international dangers of economic expansion and development. "Nations should place high priority on the development of blueprints for the economics of peaceful stability," Brower intoned. "Exhortations for a 'vigorous, growing economy' by international leaders must be placed in the context of an Earth of fixed size. Only so much growth is possible before the natural balance is destroyed and *all* growth with it."[204] Later that month, a massive oil blowout inked several newspaper headlines and saturated the once-sparkling coast of Santa Barbara, California with evidence of Brower's own exhortation that nature's exploitation needed rational restriction. Within the United

States, home to Earth's most advanced industrial economy, questions on the planetary implications of growth grew increasingly from lone voices in the wilderness into a chorus. While that chorus echoed in the affluent societies of the global North, it seemed so concerned about an impending environmental doom that it gave little to no consideration of LDC concerns as to the proposed end of their economic development. Nonetheless, the chorus grew to include people and politicians throughout the United States and in Europe.

Mobilizing Environmental Awareness

Not just in the United States, but across industrial Europe, environmental awareness and concern spread rapidly. For those along the English Channel, the 1969 oil blowout in the Santa Barbara Channel recalled similar ruin two years earlier, when an oil supertanker named the Torrey Canyon crashed and coated England's Cornwall coast in crude before winds swept the sludge over to France's Brittany coast. Political scientist Richard Falk described it as "the Hiroshima of the environmental age." The cleanup cost for taxpayers contributed to the 1969 Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, and the Convention on Civil Liability for Oil Pollution Damage.[205] That year, English ecologist Sir Frank Fraser Darling introduced a broad audience on human-environment relationships by delivering the BBC's influential Reith Lectures

[204] "Earth National Park" (display ad), *New York Times*, January 14, 1969, 30-31, emphasis in original.

[205] Richard A. Falk, *This Endangered Planet: Prospects and Proposals for Human Survival* (New York: Vintage Books, 1971); John McCormick, *The Global Environmental Movement* (West Sussex,

on the theme of "Wilderness and Plenty." After attending Barry Commoner's Airlie House conference on ecology and development, Darling's lecture on "The Technological Experiment," outlined the ecological consequences of the industrial revolution and the environmental hazards involved with uncontrolled economic development, while his analysis on "Global Changes – Actual and Possible" and "Where Does Responsibility Lie?" addressed needed alterations to humanity's mishandling of the global commons.[206]

Other Europeans also spoke up to propel the environmental revolution in the global North. In Scandinavia, articles by Swedish soil scientist Svante Odén raised alarms about atmospheric industrial effluents crossing borders and falling as acid rains, which may have inspired Swedish diplomats to request holding the UNCHE.[207] International conservationist Max Nicholson continued providing his planetary perspective. In the late 1940s, Nicholson and UNESCO director Julian Huxley helped form the Scientific International Union for Conservation of Nature (IUCN); Nicholson then co-founded the World Wildlife Fund; and he served as a longtime director-general of the Nature Conservancy before working as the convener for conservation of the International Biological Program. In 1969, Nicholson happily reported seeing Europe and North America engaged in a contemporary "environmental revolution," and he described the first generation of

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UK: John Wiley & Sons, 1995), 69; Stanley Johnson, *The Politics of Environment: The British Experience* (London: Tom Stacey, 1973).

[206] Frank Fraser Darling, "Wilderness and Plenty," BBC Reith Lectures, November-December 1969, http://www.bbc.co.uk/programmes/p00h3xk5/episodes/guide, accessed January 14, 2014.

[207] Svante Odén, "Nederbördens försurning," *Dagens nyheter*, October 24, 1967; Svante Odén, "Acidification of Air and Precipitation and Its Consequences on the Natural Environment," (Stockholm: Swedish State Natural Science Research Council, 1968).

environmentalists as "New Masters of the World."[208] In light of Spaceship Earth, the new environmentalism was unabashedly global in scope. But if Nicholson was right, the New Masters of the World would be rather similar to the Old Masters given environmentalism's distinct appeal in the industrialized North.

Also in 1969, the environmental revolution spread in the new era of East-West détente to influence the North Atlantic Treaty Organization (NATO). At the commemoration of the twentieth anniversary of signing the North Atlantic Treaty, President Nixon told his Northern allies how advanced nations like theirs shared both the "benefits and the gathering torments of a rapidly advancing industrial technology." Together, he declared, "the industrialized nations share no challenge more urgent than that of bringing twentieth-century man and his environment to terms with one another – of making the world fit for man, and helping man to learn how to remain in harmony with the rapidly changing world."[209] Pushed strongly by United States insistence, NATO—the world's most powerful military organization in history—established that spring its new Committee on the Challenges of Modern Society (CCMS), designed specifically to engage the new onslaught of environmental challenges.

For Nixon, the environment offered a political issue like motherhood that no one would oppose, and where the United States could exert leadership. Additionally, with increasing concern over the environmental affects of economic development,

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[208] Max Nicholson, *Environmental Revolution: A Guide for the New Masters of the World* (London: Hodder and Stoughton, 1969); Bob Boote, "Obituary: Max Nicholson," *The Guardian*, April 28, 2003.

Nixon's international pursuit of environmental issues, and his efforts to institutionalize them within NATO's CCMS, could allow him to appear pro-environmental without having to make any sweeping changes in the US economy. Nixon also intended the CCMS to advance his policies of détente via international environmental cooperation. Part of his goal for promoting détente included increased dialog on any and all fronts with the Soviets. As long as they remained in dialog on various fronts, possible tensions could resolved and hope remained for eventual cooperation and mutual agreement. NATO, for Nixon, therefore offered an institution for engaging both allies and enemies on an issue of mutual concern: the environment.[210]

Though initially reluctant, European allies in the Northern Alliance agreed and began marching toward environmental action on a number of environmental research projects. A State Department telegram to the U.S. Mission to NATO later explained, "Our rational is simply that all industrially advanced societies, regardless of the social systems, share increasingly urgent environmental problems, many of which cross national boundaries and can only be solved in international context."[211] While the environment became "fodder in the process of East-West détente," its

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[209] Nixon, from April 1969, quoted in the preface to the report to the President, Office of Science and Technology, "Protecting the World Environment in the Light of Population Increases," February 1970.

[210] For additional analysis on the environment in East-West détente and NATO's CCMS, see Jacob Darwin Hamblin, "Environmentalism for the Atlantic Alliance: NATO's Experiment with the 'Committee of Modern Society," *Environmental History* 15 (January 2010), 54-75; and Kai Hünemörder, "Environmental Crisis and Soft Politics: Détente and the Global Environment, 1968-1975," in *Environmental Histories of the Cold War* (New York: Cambridge University Press, 2010), 257-276.

[211] Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 291, Telegram 27061 From the Department of State to the Mission to

affect on North-South relations remained unclear, especially as questions on the implications of industrial growth continued percolating in the global North without much input from LDCs.[212]

In March 1969, even the International Development Review—a magazine dedicated to the promotion of international economic development—warned that "International Development Can Destroy the Environment." Citing ecological failures from development projects in Iraq, Israel, Egypt, Pakistan, Vietnam, Peru, and Brazil, it advocated effective "controls on air, water, and land" as part of all future development programs.[213] That year, Iranian M. Taghi Farvar edited selected papers from the Airlie House conference and labeled their development pitfalls as an "unforeseen international ecologic boomerang."[214] Barry Commoner reiterated those lessons to a separate conference sponsored by the U.S. National Commission for UNESCO and titled, "Man and His Environment: A View Toward Survival." Commoner warned the US UNESCO commission that ecologically damaging "technologies are now so massively embedded in our system of industrial and agricultural production that an effort to make them conform to the demands of the environment will involve serious economic dislocations."[215] Ecology and economy, though interrelated, appeared in conflict.

North Atlantic Treaty Organization, the Mission to the United Nations European Office, and to UNESCO, Washington, February 24, 1970.

[212] Jacob Darwin Hamblin, "Environmentalism for the Atlantic Alliance: NATO's Experiment with the 'Committee of Modern Society," *Environmental History* 15 (January 2010), 54-75, here 71.

[213] "International Development Can Destroy the Environment," *International Development Review* 11:1 (March 1969), 22-23.

[214] M. Taghi Farvar and John P. Milton, eds., *The Unforeseen International Ecologic Boomerang* (New York: American Museum of Natural History, 1969).

[215] Barry Commoner, "The Ecological Facts of Life," in *No Deposit – No Return,* edited by Huey D. Johnson (Reading, MA: Addison-Wesley Publishing Co., 1970), 34, anthology of papers presented

Stanford biologist, Paul Ehrlich, who expressed greater concern with the ecological consequences of overpopulation, also spoke to the US UNESCO gathering about economic reconsiderations. After suggesting the addition of a temporary sterilant to food and water supplies as a means to control run away population, he even encouraged the United States to withhold economic aid to countries not trying to limit their own populations. Reverberating the rhetoric of Kenneth Boulding, Ehrlich called for "a fundamental change in economic philosophy," specifically to transition from the current "cowboy economy" toward a stable-state spaceman economy. "Extreme political and economic pressure," Ehrlich concluded, "should be brought on any country or international organization impeding a solution to the world's most pressing problem."[216] Leading environmental experts clearly advocated drastic decisions of domestic and international consequence. Yet, their viewpoints on how to proceed differed markedly. Here marked the initial meeting of Barry Commoner and Paul Ehrlich. While both believed Spaceship Earth faced a dire environmental crisis, Commoner remained focused on technological intrusions to nature and the social systems that governed them, while Ehrlich remained focused on overpopulation. Their continued conflict, addressed in Chapter 8, helped make the environmental moment and amplified until its climax in Stockholm.[217]

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at the 13th National Conference of the U.S. National Commission for UNESCO, "Man and His Environment: A View Toward Survival," November, 1969.

[216] Paul R. Ehrlich, "The Population Explosion: Facts and Fiction," in *No Deposit – No Return,* edited by Huey D. Johnson (Reading, MA: Addison-Wesley Publishing Co., 1970), 44, anthology of papers presented at the 13th National Conference of the U.S. National Commission for UNESCO, "Man and His Environment: A View Toward Survival," November, 1969. See also, Gladwin Hill, "A Sterility Drug in Food Is Hinted," *New York Times*, November 25, 1969, 19.

[217] See Chapter 8 for further analysis of the Commoner-Ehrlich's environmental conflicts.

Amid continued questioning over the environmental impact of economic development, administrators who funded international development projects for the influential Ford and Rockefeller Foundations took note of the new environmental revolution, though they were admittedly "not sure how to approach this entire domain," particularly regarding the UN. In New York, they asked their Scandinavian connections in the UN how the announced but undefined UNCHE might redefine international development practices.[218] The UN, after all, became an apostle of development in the 1960s, throughout the UN Development Decade. But the environmental anxieties expressed by UN Secretary-General U Thant Had confused them. "I can only conclude from information that is available to me as Secretary-General," U Thant had warned earlier in 1969, "that the members of the United Nations have perhaps ten years left in which to subordinate their ancient quarrels and launch a global partnership to curb the arms race, to improve the human environment, to defuse the population explosion, and to supply the required momentum to world development efforts."[219] But if the root of the environmental and population crises lay in the very processes of economic development, as indicated by veterans from the Airlie House conference and other environmental spokesmen, and if humanity had only one decade to solve these crises before global collapse, how then could reasonable solutions to the crisis encourage development

[218] William S. Moody to Rockefeller Brothers Fund Files, "Memorandum: Conservation, Ecology, and the Environment Overseas, Particularly in the Developing World," September 15, 1969, and William S. Moody to Rockefeller Brothers Fund Files, "Memorandum: UN Conference on the Environment in 1972," September 19, 1969, Folder 6209, Box 1020, RG 3.1 Rockefeller Brothers Fund Archives, Rockefeller Archive Center, Sleepy Hollow, New York.

[219] U Thant quoted in Louis B. Sohn, *The United Nations: The Next Twenty-Five Years, Twentieth Report of the Commission to Study the Organization of Peace* (New York: Commission to

and industrialization? The upcoming UNCHE would have to address these questions, both for the success of the UN's first intergovernmental single-issue conference, and possibly, for the survival of humanity.

Among the information available to U Thant when he made his bold prediction included was an ECOSOC publication titled, "Problems of the Human Environment." In May 1969, ECOSOC had released its report, prepared hastily to meet requirements established UN resolution 2398 (XXIII). As the first major planning document for the upcoming UNCHE, the ECOSOC report seemed to combine the diatribes by Barry Commoner and Paul Ehrlich in specifying three primary problems behind the environmental crisis: increased population growth, growing urbanization, and the accelerated impact of industrialization. The latter received particular attention. The side effects of "uncontrolled industrialization," the report emphasized, were "a direct cause of many serious environmental problems." For example, reliance on the combustion of fossil fuels over the past century had "brought a 10 per cent increase in atmospheric carbon dioxide." Yet, with increased rates of combustion, the report predicted levels could rise beyond "25 per cent by the year 2000 A.D." Though admitting uncertainty of the effects "upon world weather and climate," the report warned the consequences of such an increase "could eventually be catastrophic."[220] Yet, other existing evidence of environmental crisis was already acute. From the compound effects of urban crowding to the poisonous

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Study the Organization of Peace, 1969), 7; later used as a preface to the introduction in *The Limits to Growth*.

[220] ECOSOC Report E/4667, "Problems of the Human Environment: Report of the Secretary-General," 47th session, agenda item 10, May 26, 1972, 5.

pesticides used in rural farming, no nation was isolated from growing global pressures.

An UNCHE was needed, the ECOSOC report claimed, because the triple threats of accelerating population, urbanization, and industrial incursions, "with their associated increase in demands for space, food, and natural resources" required careful planning and coordinated action at "local, regional, national and international levels." The UNCHE, planned for 1972, would analyze and address the "economic results of failure to take action, as well as the costs involved in attacking these problems." Though recognizing the expected high cost of actions toward environmental protection and improvement—and the expected reluctance for such funding from LDCs—the ECOSOC determined "the alternative to such a program is accelerating human misery and mortality." To avoid such misery, the report declared, the UNCHE would offer an intergovernmental forum for eventual "international or regional agreements on specific environmental problems," and the "formulation of practical and long-term governmental policies and international action."[221] The ECOSOC report first oriented the upcoming UNCHE toward the environment concerns echoing throughout the global North. Additionally, initial intentions for the first worldwide conference on the environment indicated action toward planetary policies. Those policies, it seemed, would apply equally to wealthy industrialized nations, as well as the relatively poor LDCs, despite their clamoring for increased development.

[221] ECOSOC Report E/4667, "Problems of the Human Environment: Report of the Secretary-General," 47th session, agenda item 10, May 26, 1972, 6, 9, 25.

After the report's release, members of Sweden's UN delegation complained in private meetings that "one of the big problems" for the UNCHE was "successfully convincing leaders of the developing countries that that it is important to take ecological and environmental factors into consideration." No surprise there, especially when Sweden's UN ambassador Sverker Åström told the UN General Assembly that the UNCHE's "great potential importance" would be for all countries to realize that "large scale application of modern technology, necessary as it is for economic progress, has certain deleterious side-effects."[222] Despite LDC trepidations, and perhaps caught up in the fearful rhetoric of the global environmental moment, in December 1969, the nations of the UN General Assembly—rich and poor alike—approved another resolution regarding the UNCHE.[223] The resolution affirmed the conference's main purpose was to encourage and to provide guidelines for action, both by national governments and international organizations, with particular attention to "enabling" LDCs to forestall environmental impairment. Importantly, the resolution also established a twenty-seven nation Preparatory Committee with a mix of LDCs and industrialized nations including Brazil, Argentina, India, Iran, the United Kingdom, the Soviet Union, and the United States. Future planning for the actions and possible international conventions for the UNCHE fell on this influential Preparatory Committee. Finally,

[222] William S. Moody to Rockefeller Brothers Fund Files, "Memorandum: Conservation, Ecology, and the Environment Overseas, Particularly in the Developing World," September 15, 1969, Folder 6209, Box 1020, RG 3.1 Rockefeller Brothers Fund Archives, Rockefeller Archive Center, Sleepy Hollow, New York; "Statement by ambassador Sverker Åström in the Second Committee," November 10, 1969, Folder 6209, Box 1020, RG 3.1 Rockefeller Brothers Fund Archives, Rockefeller Archive Center, Sleepy Hollow, New York.

[223] UN General Assembly resolution 2581 (XXIV) "United Nations Conference on the Human Environment," December 15, 1969.

the UN resolution also accepted Sweden's offer to host the 1972 UNCHE in Stockholm.

Despite renewed approve for the UNCHE in the UN General Assembly, and agreement by several LDCs to participate in planning via the UNCHE Preparatory Committee, Sweden expressed private concerns. Days after UN approval to host the UNCHE in Stockholm, in a private meeting, Lars-Goran Engfeldt, a member of Sweden's UN mission told funding administrators from the Rockefeller Foundation that "special attention" for future UNCHE planning would have to focus on "How to persuade international and national development agencies to take ecological and environmental aspects of development fully into account in their planning," and "how to persuade national and local leaders in the developing countries to take ecological and environmental aspects into account in development planning."[224] Successfully saving Spaceship Earth, and importantly, success for a global environmental conference required global participation. Yet, for LDCs with primary interests in economic expansion, the initial rhetoric surrounding the UNCHE appeared dubious at best. At worse, environmental protection seemed a convenient excuse for industrialized countries to further control economic growth, possibly freezing international development. LDCs allowed UNCHE planning to proceed, but as new policies emerged in response to environmental concern in industrialized nations, LDCs began wondering if neocolonialism was growing green.

[224] William S. Moody to Rockefeller Brothers Fund Files, "Memorandum: The 1972 UN Conference on the Human Environment – Conversation with Lars-Goran Engfeldt, Swedish Mission

Environmental Revolution: United States and Europe

In 1970, across nations in the global North, revolutionary rhetoric and action toward environmental regulation reached fever pitch proportions, particularly in the United States.[225] By January 1970, the U.S. Congress had passed and President Nixon had signed the transformative and now widely emulated National Environmental Policy Act (NEPA), drafted originally by Airlie House veteran Lynton Caldwell. The legislation made environment a government prerogative and required, for the first time ever, environmental impact statements for any proposed action by agencies of the federal government. It also stressed the need for international cooperation and government support for such initiatives. That month, Nixon appointed Russell Train, chairman earlier of the Airlie House conference, to direct his new executive-level Council on Environmental Quality (CEQ), tasked with coordinating America's federal environmental efforts and developing new environmental policies. Nixon also made Russell Train his personal envoy to initiate a new phase in international relations on collective environmental action.[226] To aid these initiatives, Nixon's Secretary of State William P. Rogers created an Office of Environmental Affairs within the Department's Bureau of International Scientific and Technological Affairs. That January, Rogers appointed Christian A. Herter, Jr.—

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to the United Nations," December 19, 1969, Folder 6209, Box 1020, RG 3.1 Rockefeller Brothers Fund Archives, Rockefeller Archive Center, Sleepy Hollow, New York.

[225] For the notion of environmental revolution in the context of the U.S. environmental movement, see Kirkpatrick Sale, *The Green Revolution: The American Environmental Movement, 1962-1992* (New York: Hill and Wang, 1993).

[226] J. Brooks Flippen, "Richard Nixon, Russell Train, and the Birth of Modern American Environmental Diplomacy," *Diplomatic History* 32:4 (September 2008), 613-638; J. Brooks Flippen, *Nixon and the Environment* (Albuquerque: University of New Mexico Press, 2000), 46-52; Lynton Caldwell, *The National Environmental Policy Act: An Agenda for the Future* (Bloomington: Indiana University Press, 1998).

an executive with Mobil Oil, a specialist in international law, and son of former Secretary of State for President Eisenhower—as his special assistant for international environmental affairs.[227]

Together, Train and Herter midwived what J. Brooks Flippen described as "the birth of modern American environmental diplomacy."[228] Environmental diplomacy for conservation and the protection of wild animals was nothing new.[229] Yet, in global economic boom in the post-World War II period, modern environmentalism had moved beyond its earlier confines for simplistic nature conservation to embrace a host of complex environmental issues affecting human health and happiness, especially those relating quality of life, including clear air and water, and reducing exposure to new industrial toxins and pollution.[230] Modern environmental diplomacy thus entailed international negotiation over issues including pollution standards as well as the use of natural resources, especially human induced environmental impacts that transgressed national boundaries and

[227] J. Brooks Flippen, "Richard Nixon, Russell Train, and the Birth of Modern American Environmental Diplomacy," *Diplomatic History* 32:4 (September 2008), 613-638; J. Brooks Flippen, *Nixon and the Environment* (Albuquerque: University of New Mexico Press, 2000), 46-52; Lynton Caldwell, *The National Environmental Policy Act: An Agenda for the Future* (Bloomington: Indiana University Press, 1998); "Herter Named to Pollution Post," *Washington Post*, January 14, 1970, A7.

[228] J. Brooks Flippen, "Richard Nixon, Russell Train, and the Birth of Modern American Environmental Diplomacy," *Diplomatic History* 32:4 (September 2008), 613-638.

[229] Kurkpatrick Dorsey, *The Dawn of Conservation Diplomacy: U.S.-Canadian Wildlife Protection Treaties in the Progressive Era* (Seattle: University of Washington Press, 1998); Kurkpatrick Dorsey, *Whales and Nations: Environmental Diplomacy on the High Seas* (Seattle: University of Washington Press, 2013). Dorsey's path-breaking historical research was among the initial work to merge environmental history with diplomatic history, yet his studies remain focused on the traditional realm of conservation diplomacy for wildlife.

[230] Samuel P. Hayes, *Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985* (Cambridge, UK: Cambridge University Press, 1987) offers a classic treatment of the transition from the conservation movement to modern environmentalism.

required international cooperation for their resolution or control.[231] With the appointment of Russell Train to the White House's new CEQ, and appointment of Christian Herter, Jr. as the State Department's lead envoy for international environmental affairs, the U.S. government signaled that environment problems had become both a domestic and international priority.

On January 12, 1970, Nixon's first State of the Union address in the new decade laid the stakes of the new environmentalism. The "great question of the seventies," Nixon told the joint session of Congress and millions watching on television, was whether humankind would "make our peace with nature and begin to make reparations for the damage we have done to our air, to our land, and to our water." The United States, Nixon assured, would answer affirmatively. But doing so, with new realizations on the environmental impact of economic development, demanded new conceptions of wealth and growth. Although the United States was, by most measures, the world's wealthiest nation, Nixon insisted that quantity of wealth did not equate with happiness, and economic growth was only good when it enhanced the "quality of life." Remarkably, Nixon encouraged policymakers to develop a new "national growth policy" that took account of these new environmental realizations. The Republican leader of the world's largest economy assured he sought "not to abandon growth, but to redirect it." Redirecting growth,

[231] Lawrence Susskind, *Environmental Diplomacy: Negotiating More Effective International Agreements* (New York: Oxford University Press, 1994) offers an analysis on how to restructure and better conduct modern international environmental negotiations. Although based on his reading of conservation and environmental treaty negotiations over much of twentieth century, Susskind's book is less historical and more instructional for contemporary environmental diplomats. Lynton K. Caldwell, *International Environmental Policy* (Durham: Duke University Press, 1984) offers a comprehensive study of global environmental negotiations conducted *after* 1972, in the wake of the

Nixon noted, required regulating and reformulating the invisible hand of the pricing system.

Nixon's surprising rhetoric in his State of the Union reflected just how high the environmental revolution and the warnings of influential environmental scientists had reached. Riffing on the environmental tragedies articulated by biologist Garrett Hardin, Nixon explained how protecting the global commons entailed environmental controls and accompanying costs.[232] "We can no longer afford to consider air and water common property, free to be abused by anyone without regard to the consequences," Nixon announced. Instead, he continued, we must "now treat them as scarce resources … This requires comprehensive new regulations. It also requires that, to the extent possible, the price of goods should be made to include the costs of producing and disposing of them without damage to the environment." Restoring nature to its natural state, Nixon admitted, would be "comprehensive and costly," but acting now would "prevent disaster later." Though unclear exactly how to reconcile what he admitted as the "contradiction between economic growth and the quality of life," Nixon remained confidant that the United States could provide global leadership for agreeing how to do so. Reiterating America's global perspective and ambition, Nixon concluded by quoting Thomas Jefferson, who in 1802 said, we act "not for ourselves alone, but for the whole human race."[233]

Stockholm Conference, without thorough analysis on the preparatory diplomacy before Stockholm or there at alternative conferences, as addressed in this dissertation.

[232] Garrett Hardin, "The Tragedy of the Commons," *Science* 162:3859 (December 13, 1968), 1243-1248.

[233] Richard Nixon, "Annual Message to the Congress on the State of the Union," January 22, 1970, http://www.presidency.ucsb.edu/ws/?pid=2921, accessed January 12, 2014.

Nixon's rhetoric on reconciling economic growth with the new environmental concerns did not go unheeded. *Fortune* magazine followed Nixon's address with a special issue on the environment. It, too, admitted that "the market as now set up is rigged against the environment … There is a huge, unintentional incentive to pollution."[234] *Newsweek* reminded readers that those unintentional incentives occurred in international contexts with planetary consequences. In January 1970, *Newsweek*'s cover story on "The Ravaged Environment" featured one of the now-famous photos of the whole earth. The new environmental revolution, it seemed, also entailed an economic revolution—one possibly led by the world's leading industrial economy.

In terms of international policy, similar suggestions for action came from Englishwoman Barbara Ward, a Baroness and an international development economist at Columbia University. Ward often advised international leaders, including the Pope; she had encouraged a Spaceship Earth analysis of interdependence in the mid-1960s; and, early in 1970, she called for an international agency to regulate ecological problems stemming from industrial development. Citing revelations from Barry Commoner, Kenneth Boulding, and the Airlie House conference, Ward determined that "the ecological failure of so many development projects" resulted from a "narrow and incomplete character of economic analysis." That narrow analysis, she noted, seemed unable to account for how "increased industrialization accelerates the depletion of the world's resources and the pollution

[234] "The Ravaged Environment," *Newsweek*, January 26, 1970, cover; "The Environment: A National Mission for the Seventies – A Special Issue," *Fortune*, February 1970, cover; see also, Jan

of the global ecosystem."[235] The economy also earned her blame for global environmental problems. How, then, might those complex problems be solved?

Ward suggested controlling the processes of economic development to achieve a combination of the "best quality of living for optimum numbers" with a "high material standard of living." To do so, she encouraged establishing a new and powerful "international agency … within the structure of the global ecosystem," one that, like the borderless nature of Spaceship Earth, required some dissolution of national borders and jurisdictions. The global environmental crisis, she thought, required reordering not just the international economy, but redefining the sanctity of sovereignty. "A high degree of national sovereignty would have to be ceded," she foretold, "when the international agency proscribed a local redistribution of land productivity, the cessation of certain agricultural methods, or certain levels of industrial pollution."[236] In this ripe moment of ecological concern, Barbara Ward, an internationally regarded development expert, warned against the environmental dilemmas caused by economic development and suggested revolutionary solutions with global implications for all nations, rich and poor.

At least in the global North, the environmental revolution seemed to know no national boundaries. It also drew in national spokesmen in Europe. In February,

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Schnaeffer, "Wall Street Tries to Do Its Ecology Thing," *Environment Action: April 22*, April 2, 1970, 5.

[235] Barbara Ward and Bruce Macleod, "An Ecological Perspective to the Need for International Cooperation in the Planning of the Natural Environment," January 1970, Box 8, Folder 110, Barbara Ward (Baroness Jackson) Papers, Georgetown University Library, Special Collections Research center, Washington, DC.

[236] Barbara Ward and Bruce Macleod, "An Ecological Perspective to the Need for International Cooperation in the Planning of the Natural Environment," January 1970, Box 8, Folder 110, Barbara Ward (Baroness Jackson) Papers, Georgetown University Library, Special Collections Research center, Washington, DC.

ministers of the Council of Europe met at the European Conservation Conference in Strasbourg, where they discussed how to harmonize creatively "conservation and development."[237] As an international organization, the Council of Europe facilitated trans-European co-operation, particularly in terms of legal standards, charters, and conventions. As a result, their meeting reflected a European inclination to establish new international standards and policies on the environmental implications of economic growth. The ministers and conference attendees—who included royal princes, government bureaucrats, directors of national environmental institutes, and various members of national academies of science—inaugurated there the "European Conservation Year 1970." The new American language on modern environmentalism, which was replacing the limited focus only on conservation, had yet to make the rhetorical leap to Western Europe. Yet, as reflected by the Council of Europe's range of subjects, conservation in Europe clearly included the new environmentalism. The conference debate in Strasbourg ranged on diverse topics of environmental management, from industry to leisure and from agriculture to urbanization, but the opening speeches all demanded action. Jacques Duhamel, the French Minister of Agriculture, declared the time for academic discussion was over. "Public opinion has reached saturation point," he announced, and, importantly, both "our happiness and our survival" were at stake.[238]

[237] Council of Europe, *Management of the Environment in Tomorrow's Europe: Proceedings of the European Conservation Conference*, *Strasbourg, February 9-12, 1970* (London: H.M. Stationary Office, 1970), 13.

[238] Council of Europe, *Management of the Environment in Tomorrow's Europe: Proceedings of the European Conservation Conference*, *Strasbourg, February 9-12, 1970* (London: H.M. Stationary Office, 1970), 17.

The Royal Prince of Liege in Belgium concurred. After all, he conceded, this year-long focus on the environment was to put Europeans "on their guard and even, let us admit, making them so uneasy that they will support large-scale action … without fear of upsetting, if need be, certain economic taboos." The Belgian prince acknowledged rapid population growth as a culprit in the environmental crisis, but he cut to the chase: "above all it is the technological upheaval which makes man hope for more material good fortune and therefore induces him to produce and consume still more." The prince chastised humanity for making "a god of economic growth," yet not paying its full price. "Shall I be out of order," the Prince of Liege asked, "if I suggest a new attitude to meet this frenzy of economic development?" He called for planned action and "financial sacrifice" of a "universal and worldwide nature." Prince Philip, the Duke of Edinburgh, tapped the rhetoric of atomic anxiety and, along the lines of Barry Commoner, applied it to new environmental concerns. Price Philip bemoaned the "fallout from the technological explosion" that had "littered Europe with immense industrial complexes belching pollution." Environmental incursions needed more study, he maintained, but "research and action must go on at the same time. … We cannot postpone decisions any longer." Similarly, the Prince of the Netherlands warned that "powerful interests whose businesses will be affected" would cast doubt on scientists' environmental warnings. Nonetheless, he advocated a "holding operation" while expediting solutions to the "main causal problems."[239] Caught up in the environmental revolution, and without

[239] Speeches in Council of Europe, *Management of the Environment in Tomorrow's Europe: Proceedings of the European Conservation Conference*, *Strasbourg, February 9-12, 1970* (London: H.M. Stationary Office, 1970), 20-30.

irony or appreciation of their immense affluence compared to most passengers on Spaceship Earth, North and South, several European princes openly questioned the costs of growth and called for a new economy of ecological equilibrium.

On the issue of industrial development, conference discussions acknowledged its many benefits when used wisely. Yet, industry's "irrational exploitation" of natural resources, they added, now threatened to destroy several species including, perhaps, human beings. Clément Bressou, a member of the Institut de France, saw industry spreading globally. Yet, he believed survival in worldwide "industrial civilization" was possible only "if it had an ethic other than the profit motive." His basis for future world survival, therefore, demanded "a scientific understanding of … environmental equilibrium." Dutch professor D.J. Kuenen, director of Holland's National Institute for Nature Management believed that "society is ready to pay the costs of eliminating pollution," but, to do so collectively, they must first "persuade industrialists." Perhaps, he suggested vaguely that the Council of Europe could bring together ecologists and industrialists "to talk things over and to establish what needs to be done."[240] However it would be accomplished, they all seemed to agree that, for the sake of survival, industry needed an environmental reckoning.

Another thing most conference attendees concluded was that solutions to the international crisis required international controls, possibly along the lines of reformulating sovereignty as suggested by Barbara Ward. The Secretary-General for

[240] Council of Europe, *Management of the Environment in Tomorrow's Europe: Proceedings of the European Conservation Conference*, *Strasbourg, February 9-12, 1970* (London: H.M. Stationary Office, 1970), 49, 52.

the Council of Europe, Luco Tončić-Sorinj, an Austrian, and Dr. V. Westhoff, a Dutch delegate and professor of biology, both called on the Council to help formulate "internationally agreed norms and binding rules" to save the environment from contamination. Likewise, Valfrid Paulsson, Director General of Sweden's new Environmental Protection Agency, and later President of the UNCHE in Stockholm, then urged "uniform legislation" for the international coordination of natural resource use. When the conference proceedings appeared in November 1970, Mr. J.M.A.H. Luns, the Dutch Minister of Foreign Affairs and then Chairman of the Council of Europe's Committee of Ministers, advised that "all sectors of our societies should be ready to support the policy measures that would inevitably entail heavy financial sacrifices, as well as restrictions on the individual's right to do what he or she likes with our common natural heritage."[241] The environmental revolution, it seemed, threatened to reorder not only economic relations and national sovereignty, it might redefine natural rights.

Near the end of the European Conservation Conference, attendees asked Henry J. Kellerman—an American observer sent from the State Department's new Office of Environmental Affairs—whether President Nixon's new environmental emphasis saw things similarly. Back in Washington, while the Conservation Conference met in France, Nixon had delivered to Congress his first "Special Message" on the environment. While the President had focused almost entirely on domestic environmental concerns, he nonetheless reiterated a need for government

[241] Council of Europe, *Management of the Environment in Tomorrow's Europe: Proceedings of the European Conservation Conference*, *Strasbourg, February 9-12, 1970* (London: H.M. Stationary Office, 1970), 7, 1.

regulation to control industrial pollution.[242] Back in Europe, Kellerman was less forthcoming. "A final solution of the pollution problem," Kellerman stated, "may be achieved only after considerable heart-searching by American politicians and public." But, along those lines, Kellerman admitted the U.S. government was now questioning "whether it can really continue to allow the indiscriminate growth of all sectors of the economy, or whether some positive selectivity will be required in order to reduce the risk of further damage to the environment."[243] The remarkable rhetoric against economic growth by government diplomats from nations across the global North reflected the seriousness of environmental anxieties at revolutionary dawn of the global environmental moment.

A few days after the European Conservation Conference concluded, Nixon's report to Congress on U.S. foreign policy for the new decade confirmed his own seriousness in formulating international agreements to stem the tide of global environmental degradation. After highlighting his forcing of NATO to face "the gathering torments of a rapidly advancing industrial technology," the President declared a need for additional environmental "institution building, and international regulatory agreements." Rhetorically, Nixon appeared convinced. He affirmed that "Environmental problems are secondary effects of technological change; international environmental cooperation is therefore an essential requirement of our

[242] Richard Nixon, "Special Message to the Congress on Environmental Quality," February 10, 1970, http://www.presidency.ucsb.edu/ws/?pid=2757, accessed January 10, 2014.

[243] Council of Europe, *Management of the Environment in Tomorrow's Europe: Proceedings of the European Conservation Conference*, *Strasbourg, February 9-12, 1970* (London: H.M. Stationary Office, 1970), 50.

age."[244] The remaining questions were now what institutions should be built, and what exactly should international environmental agreements agree to do?

International Institutions and Environmental Action

Early in 1970, Dr. Lee DuBridge, the science advisor to President Nixon, offered his own answers. At the President's request, DuBridge oversaw preparation of a government report titled, "Protecting the World Environment in Light of Population Increases." Before delivering his report on protecting the world environment to the President, DuBridge ensured it earned broad support through the government. DuBridge gained endorsement from directors of the Departments of State; Interior; Agriculture; Health, Education, and Welfare; the Office of Intergovernmental Relations; the National Science Foundation; and the U.S. Agency for International Development (US AID). Russell Train, chair of the new CEQ, also concurred with the reports findings and recommendations. DuBridge, in a letter to Nixon accompanying the report, noted that, given the nature of the interconnected biosphere, "no single country can solve its environmental problems alone." Yet, like the President's recent addresses, DuBridge acknowledged that industrialized nations, "with the tools and products of modern technology," affected the environment at a far greater rate than the LDCs. The United States, with responsibility as a "great scientific and technological power," should therefore "take a lead role in mobilizing

[244] Richard Nixon's "First Annual Report to the Congress on United States Foreign Policy for the 1970s," February 18, 1970, http://www.presidency.ucsb.edu/ws/?pid=2835, accessed December 8, 2013.

necessary international action to protect the world environment."[245] Some of his recommendations, however, carried international financial implications.

DuBridge's widely approved report stated that "Unwise development may carry with it latent threats to human welfare and to the environment." New and seemingly sudden realizations about environmental degradation meant "rapidly entering a new era in which the international framework for directing attention to environmental questions will affect the pattern of development on the spaceship Earth for decades to come." Toward those ends, the report recommended that U.S. foreign assistance programs, especially US AID, should now include "environmental considerations" in their aid to LDCs. The report also suggested all international financing institutions and U.S. foreign investors do likewise. As for institution building, the report encouraged U.S. environmental leadership in the UN, especially for its upcoming UNCHE to develop there new "internationally agreed criteria and standards for air and water quality."[246] DuBridge and the heads of several key agencies in the U.S. government encouraged the President to use American power and knowledge in the new global environmental moment. They suggested doing so through multilateral cooperation on the global environment through the existing political infrastructure of the UN.

[245] Lee A. DuBridge, Science Advisor to the President, to President Richard Nixon, February 5, 1970, Folder SCI 41 1/1/70, Box 2890, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD.

[246] "Protecting the World Environment in Light of Population Increases: A Report to the President," February 1970, pp. 2, 3, 22-36, Folder SCI 41 1/1/70, Box 2890, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD.

Along those lines, in March 1970, the twenty-seven-nation Preparatory Committee for the UNCHE, established three months earlier, met in New York for the first of its four formal planning sessions. Consideration of UNCHE program content clearly reflected environmental concerns of the global North; the UNCHE program then revolved mostly around means for pollution control, particularly industrial pollution. Similar to DuBridge's report to President Nixon, the initial recommendations of the UNCHE Preparatory Committee also affirmed that "pollution control can best be achieved through international cooperation." To accommodate such controls, the UNCHE working group noted that "certain international regulatory 'legislative' action may be needed … in the form of conventions or agreement." Such a program, however, seemed to scare off LDCs from an interest in the UNCHE. Despite its claim to have taken "due account" of environmental stresses caused by regional and national differences in social and economic development, the Preparatory Committee still admitted a need to "to ensure adequate representation from developing countries."[247] With apparent LDC disinterest, the first meeting for UNCHE planning seemed destined only to address environmental issues of concern in the global North. Additionally, as environmental anxiety in the global North peaked, the UNCHE appeared intent on institutionalizing international environmental standards and conventions multilaterally via the UN. One of the deans of American diplomacy, however, offered a different view.

[247] United Nations, *Report of the First Session of the Preparatory Committee for the UN Conference on the Human Environment*, *New York, March 10-20, 1970,* UN General Assembly document A/CONF.48/PC.6 (April 6, 1970), 18-19, 23.

In 1947, George F. Kennan, intellectual father of America's Cold War containment policy, had made famous his call to check Soviet expansion in the pages of *Foreign Affairs*, the leading American journal for analysis of foreign policy and global affairs. In 1970, amid growing hysteria over environmental crisis, Kennan again turned to *Foreign Affairs* to propose how "To Prevent a World Wasteland." Then a faculty member at the Institute for Advanced Study in Princeton, New Jersey, Kennan had like many other Americas became fearful of "the growing chorus of warnings from qualified scientists" that "industrial man" threatened catastrophe for "the entire ecology of the planet," and human civilization with it. Believing the crisis warranted immediate response, Kennan, as a realist, rejected DuBridge's multilateral approach via the UN. Instead, typical of Kennan's elitist, even racist, ideologies and his contempt for piddly LDCs, Kennan proposed elite action.[248]

For Kennan, resolving global environmental problems would only be slowed by global participation. International environmental action and protections, like his suggested action to internationally protect democracy against communist encroachment, should be conducted by the world's most powerful nations. "Roughly the ten leading industrial nations of the world," Kennan advised, should capitalize on détente and independently constitute "something in the nature of a club for the preservation of natural environment." This industrial club, he envisioned, would then create a new institution, first to advise other nations on environmental amelioration and establish international environmental standards. "Someone, after all, must decide

[248] George F. Kennan, "To Prevent a World Wasteland: A Proposal," *Foreign Affairs* 48:3 (April 1970), 401-413, here 401; on containment, see "X" (George F. Kennan), "The Sources of Soviet Conduct," *Foreign Affairs* 25:4 (July 1947), 566–582.

at some point what is tolerable and permissible here and what is not," he affirmed. Eventually, Kennan foresaw how this new institution would expand its function "from that of an advisory agency to that of the single commanding International Environmental Authority." The new Authority would then engage "vigorously and impartially, in the work of enforcement of rules and standards."[249] For Kennan, it seemed, industrial crisis justified industrial coercion. If the early UNCHE plans nominally sought LDC participation even if it dismissed LDC interests for Northern environmental concerns, Kennan's institutional solution to global environmental crisis would eliminate LDC participation entirely.

Kennan argued strongly against involving the UN in his proposal for Northern environmental institutional hegemony. Admittedly, no government could solve the global crisis alone, but, to Kennan, gaining sanction from the entire international community "would scarcely be a promising undertaking." Using the UN to institute environmental action, instead of establishing an Environmental Authority by industrial leaders, would mean involving "a host of smaller and less developed countries which could contribute very little to the solution of the problems at hand." Furthermore, including LDCs would "involve formidable delays and heavy problems of decision-taking," when drastic environmental action was needed now. The industrial superpowers should establish their own international organization to oversee global environmental and industrial processes, if not with the participation of all, for the betterment of all. "In problems of international organizations, as in war," Kennan maintained, "one does well to follow the Napoleonic principle: 'On

[249] Kennan, "To Prevent a World Wasteland," 401, 410-411, 412, 409.

s'engage et puis on voit' [First you engage, and then you see.]" As a grand realist in American foreign relations, Kennan concluded that "To engage oneself means, in this instance, to bring into being the personality. The rest will follow."[250] In Kennan's view of preponderant American power, his global Environmental Authority would simply establish its own rules and, eventually, the LDCs would fall into line. Lines, indeed, had been drawn as to how to institutionalize efforts toward solving global environmental problems. But it remained unclear how the industrial or the less developed nations would respond.

Not only some American academic elites, but also its general public grew anxious for environmental action. On April 22, 1970, American environmental awareness and concern exploded in a nationwide outpouring of celebration and protest for the world's first Earth Day. Just fifteen months after the Airlie House conference and the initial images of Earth from space, Earth Day saw everyday Americans across the entire nation take to the streets in what was then the largest single-day public protest in U.S. history. Even Wisconsin Senator Gaylord Nelson, who originated the idea for Earth Day a year earlier, was surprised, calling the occasion a "truly astonishing grass-roots explosion."[251] The first Earth Day drew an estimated twenty million participants across the United States—roughly a tenth of the national population—with involvement from over ten thousand schools and two thousand colleges and universities. In the week of Earth Day, newspapers, magazines, and television all gave environmental events unprecedented attention.

[250] Kennan, "To Prevent a World Wasteland," 410, 412-413.
[251] Nelson quoted in Kirkpatrick Sale, *The Green Revolution: The American Environmental Movement, 1962-1992* (New York: Hill and Wang, 1993), 24.

Public broadcasting stations committed entire days worth of programming to the need for environmental protection. All three of America's major television stations, and one television crew from Japan, granted significant coverage to huge Earth Day gatherings in New York, Washington DC, even Birmingham, Alabama, all of which featured relentless speeches by politicians, professors, even union leaders like Walter Reuther.[252]

As part of the era's impetus for social and political transformation, Earth Day reflected how environmental issues had rapidly mobilized new publics for radical reform and institutional action. Indeed, the small organization created to orchestrate and nationally coordinate the first Earth Day took the name Environmental Action. *The Environmental Handbook*, an original paperback created to accompany the first national environmental teach-in, appeared only three months earlier yet sold more than a million copies before the end of April. Along with Paul Ehrlich's warnings about impending "Eco-Catastrophe!," it reprinted admonitions from Kenneth Boulding and others for stabilizing economic growth.[253] Along those lines, Dennis Hayes, the twenty-five year old national coordinator for Environmental Action, announced on Earth Day, "We are building a movement … a movement that values people more than technology, people more than political boundaries and political

[252] Details on Earth Day in J. Brooks Flippen, *Nixon and the Environment* (Albuquerqu: University of New Mexico Press, 2000), 1, 7-14; Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement* (Washington: Earth Island Press, 2005), 148-158; Michael Egan, *Barry Commoner and the Science of Survival: The Remaking of American Environmentalism* (Cambridge: MIT Press, 2007), 109-119; Adam Rome, "The Genius of Earth Day," *Environmental History* 15 (April 2010), 194-205; Adam Rome, *The Genius of Earth Day: How a 1970 Teach-In Unexpectedly Made the First Green Generation* (New York: Hill and Wang, 2013).

[253] Garrett De Bell, ed., *The Environmental Handbook: Prepared for the First National Environmental Teach-In, April 22, 1970* (New York: Ballentine Books, Inc., and Friends of the Earth, 1970).

ideologies, people more than profit."[254] This exuberant new environmental movement, according to historian John McNeill, arose "in a context of countercultural critique of any and all established orthodoxies." But, at its root, Earth Day—and the simultaneous flowering of international concern about people's relations to the biosphere—also constituted "a complaint against economic orthodoxy … It was a critique of the faith of economists and engineers, and their programs to improve life on earth." For new adherents to this ecological insight, the popularity of Earth Day's events contributed collectively to "a general sense that things were out of whack and business as usual was responsible."[255] For millions of citizens demanding domestic and international action to save Spaceship Earth, business as usual needed to change, particularly its narrow focus on economic growth and industrial development.

While questions of how to institute and enforce international environmental standards remained unclear, in July 1970, just after America's 194th birthday, President Nixon took action. Under Reorganization Plans No. 3 and No. 4, both executive orders submitted to Congress, Nixon captured political capital domestically by creating a new Environmental Protection Agency (EPA) and, within the Department of Commerce, he established simultaneously the National Oceanic and Atmospheric Administration (NOAA). According to Nixon's Congressional submission, the new EPA amalgamated the federal government's disparate pollution

[254] Dennis Hayes quoted in National Staff of Environmental Action, eds., *Earth Day: The Beginning* (New York: Bantam Books, 1970), xv.

[255] J.R. McNeill, "The Environment, Environmentalism, and International Society in the Long 1970s," in The Shock of the Global: The 1970s in Perspective, edited by Niall Ferguson, Charles S.

control authorities under an independent agency for the principle purpose "to set and enforce" environmental protection standards. The EPA thus centralized the government's "critical standard-setting functions" for the betterment of life in the United States and on Spaceship Earth.[256]

In the federal reorganization plans, Nixon reiterated his earlier messages that "Arresting environmental deterioration is of great importance to the quality of life in our country and in the world." Nixon's domestic establishment of EPA eventually offered a model later adopted and adapted by other nations, including Japan. It also offered possible encouragement for international institutions that might likewise reorganize and regulate for global environmental quality. If the exact form of an international environmental organization remained up for debate, the fact that such an institution must appear seemed increasingly apparent. As Claire Sterling, the Italian-based reporter on the global environmental crisis for the *Washington Post*, noted: "If the planet is to be reasonably livable somewhere around the year 2000, we are going to have to have planetary rules, planetarily devised, imposed, and policed."[257] As in other areas—economic, bellicose, or environmental—America's actions for a centralized environmental agency set an important precedent, both for industrialized nations and for the rest of the world, especially as the world's largest and most dynamic economy.

Maier, Eraz Manela, and Daniel J. Sargent (Cambridge, MA: Harvard University Press, 2010), 262-278, here 265, 266, 272.

[256] Richard Nixon, "Reorganization Plans Nos. 3 and 4 of 1970: Message from the President of the United States," July 9, 1970, Document No. 91-366, House of Representatives, Ninety-first Congress, Second Session, http://www.epa.gov/ocir/leglibrary/pdf/created.pdf, accessed January 12, 2014.

[257] Claire Sterling, "Efforts Begin to Compute the Worldwide Eco-Crisis," *Washington Post*, July 20, 1970, A22.

How then would Japan, another of the world's largest and most dynamic industrialized economies, respond in the global environmental moment? Since its defeat in World War II, Japan had maintained devout focus on the imperatives of increasing Gross National Product. Yet, amid the revolutionary rhetoric about the environmental problems posed by unrestrained economic development in much of the global North, Japan also found itself swept up in the environmental revolution, with consequences for its internationally focused economy.

Japan, Industrial Pollution, and International Trade

Among the industrial capitalist core in the global North, no nation experienced greater sustained economic growth between the end of World War II and 1970 than Japan. One hundred years earlier, in the 1870s, Japan began rapid industrialization under the Meiji Restoration. By 1940, Japan expanded its reach for resources into a massive, well-armed empire over much of the Asian Pacific. Defeat in World War II ended Japan's military imperialism, but its industries rose from their atomic ashes to ignite a new stage of "miraculous" economic growth. Between 1954 and 1963, Japan's national production more than doubled with annual average GDP growth of 9.4%, compared to American growth in the same period of 2.8% and English growth of 2.5%. Between 1965 and 1970, Japan's growth rate grew to hover comfortably between eleven and thirteen percent; and between 1950 and 1970, booming sales of Japanese goods abroad tripled their share of the world's total exports. Despite having lost their Pacific empire, by 1968, Japan became an economic superpower—not only as the industrial and commercial leader of East

Asia, but as the third largest economy on the planet, soon to be second-largest behind the United States. Yet due to the concomitant rise of environmental degradation alongside its industrial expansion, in 1970, Japan joined Western Europe and the United States in the environmental revolution.[258]

By the late 1960s, after single-minded, post-war pursuit of Gross National Product, the accumulated evidence of Japan's industrial pollution inspired widespread demand to consider, instead, what some Japanese observers called "gross national welfare."[259] Numerous cases of industrial poisoning from mercury, cadmium, arsenic, chemical pesticides, and atmospheric emissions led to public cries for government action against environmental pollution—or, in Japanese parlance, *kōgai* (literally, "public hazards" or "public damage"). In 1967, the Japanese Ministry of Health and Welfare proposed the Basic Law for Pollution Control. The Basic Law sought to "combat environmental pollution" and provided a moral authority to protect "the people's health and the conservation of their living environment." Yet, Japan's business community and its powerful economic ministries lambasted early drafts for prioritizing environmental health over economic growth. As a result, Prime Minister Eisaku Sato weakened the bill, inserting an infamous "harmony clause" that stated, "preservation of the living environment shall be carried out in harmony with the healthy development of the economy." Passage of

[258] Yoshikazu Miyazaki, "Rapid Economic Growth in Post-War Japan," *The Developing Economies* 5:2 (June 1967), 329-350; Michael H. Hunt, *The World Transformed: 1945 to the Present* (Boston: Bedford/St. Martins, 2004), 210-213; Selig H. Harrison, "Japan Debates Anti-Pollution Fight," *Washington Post*, October 18, 1970, A4. For more on Japan's post-war economic growth, see Chalmers Johnson, *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975* (Stanford: Stanford University Press, 1982); James Vestal, *Planning for Change: Industrial Policy and Japanese Economic Development, 1945-1990* (Oxford: Clarendon Press. 1993).

the Basic Law in 1967 thus became largely symbolic. It failed to specify standards for the emission of various pollutants and provided no mechanisms for relief or compensation to pollution victims. Public outcries mounted, however, as the scope and publicity of Japan's pollution problems magnified.[260]

A few years later, as Americans prepared for Earth Day, the U.S. embassy in Tokyo announced that environmental "public hazards" had become Japan's "sexiest political issue of 1970." After years of Japanese politicians voicing "perfunctory concern of public hazards," the Tokyo embassy told Washington that industrial pollution had "dramatically emerged as Japan's number one domestic political issue in spring 1970." Japan's anti-pollution outburst harmonized with a similar surge in the United States and Europe, the embassy explained, after an "almost overwhelming scale of urban pollution began to impinge noticeably on [Japanese] daily life." The embassy also reported how Japan's "mass media gave intensive coverage to sudden U.S. preoccupation with [the environmental pollution] problem," while Japan's political opposition parties seized environmental concerns to critique the long-standing rule of Japan's Liberal Democratic Party.[261] Many Japanese realized, in the words of historian Brett L. Walker, that their nation and their homes had become "a gargantuan hybrid environment … one interlaced with complex, historically constructed ecological pathways that, in inauspicious instances, eventually lead from

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[259] Selig H. Harrison, "Japan Debates Anti-Pollution Fight," *Washington Post*, October 18, 1970, A4.

[260] Brett L. Walker, *Toxic Archipelago: A History of Industrial Disease in Japan* (Seattle: University of Washington Press, 2010), 217-219; Jeffrey Broadbent, *Environmental Politics in Japan: Networks of Power and Protest* (Cambridge: Cambridge University Press, 1998), 118-121.

[261] Telegram from American Embassy, Tokyo, to Secretary of State, Washington, "Politics of Pollution: Issue During Coming Decade," September 26, 1970, Folder SCI 41 9/1/70, Box 2890,

industrial facilities to human consumers."[262] A key event occurred that summer. In late July and early August 1970, several asthma suffers died and nearly 9,000 others in Tokyo sought treatment for lung, throat, and eye ailments after photochemical smog blanketed the megacity. Prime Minster Sato immediately created and chaired a new cabinet-level group called the Central Pollution Countermeasures Conference (CPCC), also described as the "anti-pollution supreme command headquarters." Ministers of the CPCC wondered how to head off environmental emergencies without hurting Japan's industry too abruptly.[263]

Coincidentally, Japan's summer smog emergency accompanied a severe air pollution episode affecting much of the U.S. eastern seaboard and prompting an exchange between President Nixon and Prime Minister Sato. According to Russell Train, Nixon's new environmental attaché, press reports of the twin events highlighted a shared dilemma: how to prevent severe environmental disruptions while continuing a rapid rate of economic growth. Nixon arranged for Train to visit Japan in October to explore cooperative efforts on their common concerns. In the meantime, the U.S. Congress responded to their environmentally charged constituents with new sweeping amendments to America's Clear Air Act—amendments that carried international implications.[264]

SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD.

[262] Brett L. Walker, *Toxic Archipelago: A History of Industrial Disease in Japan* (Seattle: University of Washington Press, 2010), 16.

[263] Selig H. Harrison, "Japan Debates Anti-Pollution Fight," *Washington Post*, October 18, 1970, A4.

[264] "Tough New Clean-Air Bill Passed by Senate, 73 to 0," *New York Times*, September 23, 1970.

In September 1970, the Senate approved its Clear Air Act amendments and began reconciling their bill with a version passed by the House of Representatives in June. Feeding off America's anti-pollution frenzy, the bills included strict new auto-emission standards to control, as one reporter called it, "killer car-exhaust." The challenge, however, was that the United States, the world's largest automotive market, was then the only nation to pass such strict environmental standards—meaning carmakers who relied on foreign sales to American consumers, like those in Britain, France, West Germany, Sweden, Italy, and Japan, might be "in for a nasty shock."[265]

The unknown international affects of the U.S. Clear Air amendments could cut two ways. If unable to meet American standards, foreign carmakers—then selling annually 1.7 million cars to American buyers, though only about one-fifth of the yearly total sold there—might be cut out of the U.S. market, essentially facing an environmental tariff that benefited American manufacturers. On the other hand, cars made by American companies, who focused increasingly on fresh leaps in foreign sales, could become even more over-priced for foreign buyers after passing to consumers their costs to accommodate new American exhaust standards. One reporter in Rome wondered,

> Was it necessarily a good idea for the United States to act on its own on this matter of planetary interest[?] … Did anybody in Congress stop to think of the possible effects on some of our closest allies abroad – the West Germans, say, or the British, a tenth of whose economy depends on car production? … Even if the answer is yes on

[265] Claire Sterling, "U.S. Auto Pollution Standards and Foreign Cars: Ecosystem Economics," *Washington Post*, November 9, 1970, A22.

> both counts, mightn't it have been better to try for a mutual agreement of all the world's car-producing nations instead[?][266]

In world interconnected, both economically and ecologically, these questions highlighted the dilemma of enacting environmental policies without multilateral discussion. It seemed to encourage the need for an UNCHE that included LDC participation. But clearly, with American environmental envoy Russell Train scheduled to visit Japan soon, the ecosystem economics of pollution standards had already created an international challenge for both nations' globalized industrial markets.

In October 1970, Train's arrival in Japan, with a ten-man envoy of American representatives, caused a spurt of attention to environmental issues in Japan's press and on television. Japanese Prime Minister Sato added to the attention by appointing Sadanori Yamanaka as Japan's new environmental coordinator just in time for the American visit. Kiichi Miyazawa, then Japan's influential Minister of International Trade and Industry, had recently announced it was time to focus on health and welfare, even if it meant "blunting to some extent" Japan's economic growth rate.[267] Prime Minister Sato, however, emphasized the importance of maintaining economic growth while dealing with environmental issues. In oblique response to criticism his

[266] Claire Sterling, "U.S. Auto Pollution Standards and Foreign Cars: Ecosystem Economics," *Washington Post*, November 9, 1970, A22. See also Claire Sterling, "Depolluting Autos Is Complex Issue: The Price of Virtue," *Washington Post*, November 9, 1971, A18.

[267] Miyazawa, who became Japan's Prime Minister in November 1991, gained unfortunate notoriety in January 1992 when visiting U.S. President George H.W. Bush vomited on Miyazawa's lap and fainted during a state dinner at the Prime Minister's home. See Michael Wines, "Bush in Japan; Bush Collapses at State Dinner with the Japanese," January 9, 1992, *New York Times*.

government had received from opposition parties, Sato told Train that a healthy economy was a prerequisite to fighting pollution.[268]

Train's delegation met with their Japanese counterparts for several days of intensive exchange. In the wake of the United States' earlier spate of environmental legislation that year—including the NEPA, the EPA, and the recently strengthened Clean Air Act—CEQ chairman Train, otherwise amiable, gave off a superior air. Train told reporters that Japan as "a long way to go" in comparison with the United States. While the new U.S. EPA commanded a $1.5 billion budget, the Japanese at that time planned to allocate only $325 million of their federal budget to anti-pollution programs. Train, hinting at Sato's earlier comments to him, suggested that Japan could comfortably pay for its pressing environmental needs given its healthy twelve percent growth rate. Japanese ministers, however, continued to express concern that significant expenditures for environmental controls might erode the competitive advantages of Japanese products in international trade. The new amendments to America's Clear Air Act hovered over the exchange.[269]

Japan's *Yomiuri Shimbun* mass-circulation newspaper, credited with the largest circulation in the world, greeted Train's delegation with a editorial on conflicts between international trade and protecting the world environment. The

[268] Telegram from American Embassy, Tokyo, to Secretary of State, Washington, "Train/Sato Meeting," and "Joint Communiqué on U.S.-Japan Conference on Environmental Pollution," October 14, 1970, Folder SCI 41 9/1/70, Box 2890, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD.

[269] Telegram from American Embassy, Tokyo, to Secretary of State, Washington, "Chairman Train's Report to the President on his Japan Visit to Intensify U.S.-Japan Cooperation on Environment," October 16, 1970, Folder SCI 41 9/1/70, Box 2890, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College

editorial included extensive quotations from a recent statement by Christian A. Herter, Jr., the U.S. State Department's new point man on International Environmental Affairs. "What happens in international trade," Herter had asked, "when one nation requires an industry to bear the cost of environmental pollution, another nations does not, and the products of both compete in international commerce?" In a lightly veiled reference to America's new auto-emission standards, Herter cited a hypothetical future law that required all automobiles sold in the United States to include a safety device that only American manufactures made. Such action would be "unwise and outrageous," Herter proclaimed. "It won't happen." But, he wondered, "in this day of unhappily increasing protectionism, is any nation totally immune from temptation?"[270]

Japanese cabinet ministers politely asked Train if the United States planned to use anti-pollution technology to restrict foreign goods from the American market. The ministers wondered whether the "real reason" for Train's visit was to drive up the costs of Japanese products through anti-pollution mandates. Might environmental standards create new economic tariffs? To avert such issues and better maintain economic equalities, another minister encouraged the United States to make its anti-pollution technology freely available internationally. Train noted recent U.S. legislation that required American businesses make available new discoveries to other firms for a fee or licensing agreement, but dodging the issue, he had to check

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Park, College Park, MD; Selig H. Harrison, "Japan Debates Anti-Pollution Fight," *Washington Post*, October 18, 1970, A4.

[270] *Yomiuri Shimbun* editorial cited in Selig H. Harrison, "Japan Debates Anti-Pollution Fight," *Washington Post*, October 18, 1970, A4.

whether such laws extended to foreign firms.[271] Despite some awkward moments, Train described his meetings with Sato and his ministers having occurred "in an atmosphere of warm cordiality." Whether new environmental standards would encourage economic protectionism remained unresolved. Both Sato and Train agreed to forward such decisions to new environmental committees in the OECD, which Christian Herter would eventually chair.[272]

Despite the Japanese government's initial hesitation, Train's visit and continued agitation for environmental reform in much of the Japanese public and press eventually made its mark. In November 1970, Prime Minister Sato's anti-pollution command took sweeping environmental action in Japan's domestic laws. Just weeks after Train's visit, Sato's environmental committee submitted a tsunami of bills to an Extraordinary Session of Japan's legislature, the National Diet. In a remarkably productive session known as the "Pollution Diet," Japan passed fourteen new anti-pollution laws. Significantly, the new laws removed the notorious "harmony clause" shielding economic development from environmental improvement. They also established financial responsibilities for pollution cleanup, expanded environmental quality standards for air pollution, and, following recent American legislation, set new emission standards for its automobiles.[273] Japan went from having some of the most lax environmental standards among industrialized

[271] J. Brooks Flippen, "Richard Nixon, Russell Train, and the Birth of Modern American Environmental Diplomacy," *Diplomatic History* 32:4 (September 2008), 622-623; Selig H. Harrison, "Japan Debates Anti-Pollution Fight," *Washington Post*, October 18, 1970, A4.

[272] Telegram from American Embassy, Tokyo, to Secretary of State, Washington, "Train/Sato Meeting," October 14, 1970, Folder SCI 41 9/1/70, Box 2890, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD.

nations to the most stringent. Prime Minister Sato celebrated the laws as "the best pollution control system in the world." Slightly altering his earlier comments to Train, Sato declared "public welfare is a prerequisite for economic growth." By the following summer, Japan would establish a ministerial Environmental Authority, modeled loosely on the U.S. EPA, though institutionally weaker and with more shared authority.[274]

Regardless, the environmental revolution seemed to reorder Japan's obsession over economic growth at all costs. Some costs, after all, were not worth the consequences. Japan's well publicized victims of Minamata methylmercury poisoning, the painful cadmium poisonings of *itai-itai* ("it hurts, it hurts") disease, and the sulfur-oxide inducement of Yokkaichi asthma from petrochemical processing, among other tragedies, led Japanese environmental reporter Keikichi Kihara to declare Japan's toxic industrial pollution problems as "much more intense and more sinister than those in other countries."[275] Yet, the Japanese government took revolutionary action to address its sinister environmental hazards. Japanese court decisions favoring environmental victims over industries and corresponding enforcement of new domestic standards, especially for air quality, reflected

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[273] Jeffrey Broadbent, *Environmental Politics in Japan: Networks of Power and Protest* (Cambridge: Cambridge University Press, 1998), 118-121.

[274] Keikichi Kihara, "Japan's Environmental Pollution at Grave Stage," *Asahi Evening News,* March 16, 1971, special supplement on pollution, enclosed in Folder SCI 41 3/1/71, Box 2891, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD; Telegram from U.S. Mission OECD, Paris, to Secretary of State, Washington, et al, "OECD Environment Committee, First Meeting, November 24-25, 1970," November 27, 1970, Folder SCI 41 OECD 1/1/70, Box 2899, SCIENCE 41 OECD, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD Jeffrey Broadbent, *Environmental Politics in Japan: Networks of Power and Protest* (Cambridge: Cambridge University Press, 1998), 120-123.

significant alterations that J.R. McNeill described as "the Japanese environmental miracle." In surprisingly short order, Japanese air pollution went from among the world's worst, to the best among industrialized nations, and it did so more rapidly than in Germany, France, Britain, or the United States. Notably, sulfur dioxide emissions declined nearly ninety percent.[276]

In the context of the environmental revolution then sweeping across the industrialized nations of the global North, what did Japan's remarkable turn toward environmental awareness and government action mean? For one thing, in the new global environmental moment, it showed how opportunities appeared ripe for revolutionary alterations, not just to domestic economies like Japan's, but also to the entire international economic order. The wave of environmental legislation in both the United States and Japan, and importantly, the establishment of high-level environmental agencies within their governments also indicated the possibility for creating radically new international institutions for regulating the global environment, perhaps via new treaties or standards established at the upcoming UNCHE. At least in nations of the global North, the environmental moment seemed ready for revolutionary changes to international economic development.

After all, the new environmental revolution had, according to Keikichi Kihara, already changed "Japan's policy since the Meiji Period of giving priority to industrial development." Keikichi Kihara had described popular and revolutionary

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[275] Keikichi Kihara, "Japan's Environmental Pollution at Grave Stage," *Asahi Evening News,* March 16, 1971, special supplement on pollution.

[276] J.R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (New York, W.W. Norton, 2000), 96-99. See also Jeffrey Broadbent, *Environmental*

anti-pollution campaigns in industrial Japan as "similar to peasant uprisings"—like something from the earlier imperial era. Earlier that century, imperial competition had twice launched the world in global conflicts that saw soldiers fighting from foxholes and trenches in a desperate struggle for survival. Now, however, the new environmental revolution seemed bound to bring the world together in what Keikichi Kihara described as a new kind of "last-ditch fight" for survival on Spaceship Earth. He predicted the environmental revolution would only expand, particularly as planning for the upcoming UNCHE finally began to move at a quicker clip.[277]

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At the close of the 1960s and the dawn of the 1970s, across much of the global North, the warnings of leading environmental scientists and environmental advocates inspired profound anxieties over global environmental stability. Government leaders in industrialized nations, from Western Europe to Japan to the President of the United States, responded to the tremendous public outcry of their citizens about new environmental threats. Amid escalating rhetoric and concern about the dangerous affect of economic development on environmental stability, governments in industrialized nations enacted new domestic environmental policies with potential implications for the international economic order. And with the UN agreeing to hold and beginning to plan a global environmental conference in Stockholm, the stage seemed set for enacting similar environmental regulations internationally. For many in the global North, they were engaged in a fight against

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Politics in Japan: Networks of Power and Protest (Cambridge: Cambridge University Press, 1998), 333-338.

global environmental degradation and battled for their future survival on Spaceship Earth

The billions of people in the global South, however, faced a very different kind of fight for survival. In wealthy and industrial nations like Japan, the environmental moment might remind reporters of prior peasant uprisings. But for LDCs of the global South, another kind of peasant uprising was brewing. Nations in the Third World demanded a different form of revolution, one predicated not on the environmental problems of affluence, but on the primacy of development to produce such affluence. As the next two chapters reveal, rather than a global environmental revolution, LDCs of the global South sought an economic revolution, one that could lift their people beyond the daily struggle for survival.

Seeking to rev the engines of growth on Spaceship Earth, not limit them, influential Third World states saw industrialization as their savior, not a demon. Brazil, in particular, took the lead in advocating these aspirations on behalf of the world's LDCs. Development and economic expansion, not environmental control, was the steady-state revolution they desired. As one of the world's largest, most populous, and resource-rich nations, Brazil leveraged its position within the UN to launch a counter-assault against the environmental revolution embodied by the upcoming UNCHE. In the global environmental moment, Brazil's battle against

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[277] Keikichi Kihara, "Japan's Environmental Pollution at Grave Stage," *Asahi Evening News,* March 16, 1971, special supplement on pollution.

environmental limits would shape the structures of global environmental politics and the direction that Spaceship Earth sailed, both then and since.

Chapter 4

DEVELOPMENT, NOT ENVIRONMENT:
Revolutionary Brazil and the UNCHE Process

"The paranoid spokesman … traffics in the birth and death of whole worlds, whole political orders, whole systems of human values. He is always manning the barricades of civilization. He constantly lives at a turning point. Like religious millenarians, he expresses the anxiety of those who are living through the last days and he is sometimes disposed to set a date for the apocalypse."

— **Richard Hofstadter, "The Paranoid Style in American Politics,"** ***Harper's Magazine,*** **November 1964.**

One prominent scholar of green development wrote "Credit for the insertion of environmental concerns into development discourse in the closing decades of the twentieth century lies in the first instance with environmentalists from Northern industrialized countries."[278] If the environmental revolution had reordered considerations of economic development in some industrialized nations of the North, this chapter shows how Brazil, a leader of the global South, positioned itself to reorder the role of development in the preparatory process for the United Nations Conference on the Human Environment (UNCHE). In the wake of Brazil's political and economic revolution in the 1960s, foreign diplomats for its military government ensured in the early 1970s that global environmental policymaking at the UN did not impede Brazil's priority of industrial development or infringe on its national sovereignty to exploit its own vast natural resources. In its promotion of economic development as the necessary key to global environmental political progress, Brazil thus played a little-recognized role in formulating the conceptual and institutional

foundations of the UN's future environmental agenda on sustainable development, and it did so twenty years before that concept achieved international popularity.

The notion of sustainable development seeks to synthesize the competing priorities of economic development and the need to maintain the long-term health and protection of the environment. According to many environmental scholars, the concept of sustainable development appears to arise in the 1980s and early 1990s based mostly on European and American thinking in the industrialized nations of the global North.[279] Commonly, after brief reference to incipient environmental awareness in the 1960s and early 1970s—with dutiful mention of Rachel Carson's *Silent Spring,* or Paul Ehrlich's *Population Bomb,* or the Club of Rome's *Limits to Growth* report[280]—the standard story of sustainable development focuses on notions of "ecodevelopment" promoted by Northern thinkers around the early 1980s. Those Northern thinkers, in turn, influenced and drew from the 1980 *World Conservation Strategy* (WCS), identified for first implementing the term "sustainable development."[281] However, the greatest praise for the development of sustainable

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[278] W. M. Adams, *Green Development: Environment and Sustainability in a Developing World*, 3rd Edition (New York: Routledge, 2009), 4.

[279] See for example, Jacob Park, Ken Conca, and Matthias Finger, *The Crisis of Global Environmental Governance: Towards a New Political Economy of Sustainability* (New York: Routledge, 2008); David Peterson del Mar, *Environmentalism* (London: Pearson Longman, 2006), 161; Norman J. Vig, "Introduction: Governing the International Environment," in *The Global Environment: Institutions, Law, and Policy*, edited by Norman J. Vig and Regina S. Axelrod (Washington, DC: Congressional Quarter Inc, 1999), 5-10.

[280] Rachel Carson, *Silent Spring* (Greenwich, CT: Fawcett Publications, 1962); Paul R. Ehrlich, *The Population Bomb*, (New York: Ballantine Books and the Sierra Club, 1968); Donella H. Meadows, et al, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Universe Books, 1972).

[281] Ignacy Sachs, "Ecodevelopment: A Definition," *Ambio* 8:2/3 (1979): 113; R. Riddell *Ecodevelopment* (Farnborrough: Gower, 1981); Bernhard Glaeser, eds., *Ecodevelopment: Concepts, Projects, Strategies* (Oxford, UK: Pergamon Press, 1984); International Union for Conservation of Nature and Natural Resources, and United Nations Environment Program, *The World Conservation Strategy* (Geneva: World Wildlife Program, 1980).

development typically goes to the Norwegian, Gro Brundtland, who in 1987 chaired the UN's World Commission on Environment and Development. Her commission's Brundtland Report is commonly celebrated for clearly codifying sustainable development and propelling its worldwide recognition to reformulate the environmental agendas of influential international organizations and development agencies.[282] As a result, then, common assumptions attribute the conceptual emergence of sustainable development from the ideas and actions of the global North. And only afterward, in those narratives, did sustainable development become the driving theme in the 1992 Earth Summit – the UN Conference on Environment and Development, held in Rio, Brazil.[283] But the whole story is both broader and deeper, both more complex and more interesting.

Brazil did play an essential role in forging environment and development into an inseparable pair for global environmental policymakers, but this did not occur not at Rio in 1992. Instead, Brazil's greatest impact in developing sustainable development came during the preparatory processes leading up to the 1972 Stockholm Conference. While Chapter 3 showed how Northern activists inserted environment into development discourse, the following two chapters show how Southern actors, led by diplomats from Brazil's Foreign Ministry, ensured that development remained the dominant focus in the UN's emerging global environmental discourse of the early 1970s. Twenty years before the Earth Summit

[282] Iris Borowy, *Defining Sustainable Development: A History of the World Commission on Environment and Development (Brundtland Commission),* (Milton Park: Routledge, forthcoming 2014).

in Rio, Brazil and its vocal cohort of developing nations, by inserting the priority of development into environmental discourses, played a significant role in laying the conceptual roots of sustainable development within the UN.

Chapter 4 first provides the political and economic context behind Brazil's counter-assault against nascent efforts in the UN for instituting global environmental limits to growth. The context of Brazil's domestic experiences in the 1950s and 1960s, during the decades before the UNCHE, helps explain its lead policymakers' insistence that international environmental policies not infringe either on Brazil's dynamic economic growth or on its national sovereignty over the use of its rich natural resources. This chapter then explains how preparations for the UNCHE, in attempts to enlist the participation of LDCs, included appointment of international development expert Maurice Strong. Significantly, Strong instituted a new style in which planning for the UNCHE sought to shape its achievements long before the conference took place in the summer of 1972. As part of this process, Brazil and other LDCs introduced a new central subject titled "Environment and Development" into the UNCHE planning. Doing so not only invested LDCs with an interest in the UNCHE, it provided the primary political battle ground on which nation states would meet in the global environmental moment until the actual UNCHE in Stockholm.

In the early 1970s, during planning for the UNCHE, Brazil's foreign ministers took the lead in touting Brazil's policies against international

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[283] Report of the World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987); see also United Nations Documents, http://www.un-documents.net/wced-ocf.htm (accessed Oct 10, 2012).

environmental controls and strongly in favor of economic development. Chief among Brazil's actors were Miguel Ozório de Almeida, special advisor on scientific and technological matters to Brazil's foreign minister; Brazil's permanent UN representative, Armando Sérgio Frazão; former UN ambassador and Brazil's ambassador to the United States, João Augusto de Araújo Castro; and their supervisor, Mário Gibson Alves Barboza, the Minister of State for Brazil's Foreign Affairs. The views of Brazil's Foreign Ministry—often called Itamaraty in Brazilian diplomatic jargon after the palace that houses its headquarters in Brasilia—reflected those of Brazil's chief policymakers, including President Emilio Medici; the Minister of the Interior, General Jose da Costa Cavalcanti; and the powerful Minister of Finance, Delfim Netto.[284] Chapters 4 and 5 detail their actions in redefining the political direction of global environmental politics during the global environmental moment. The reasons for their redirection stem back to economic and political experiences of Brazil in the 1950s and 1960s.

The Brazilian Boom

In the decades after World War II, Brazil— the fifth-largest and fifth-most populous country in the world, and the single largest, most populous country in Latin America—contained vast natural resources, including the immense Amazon River Basin. Yet, when comparing Brazil to the industrial juggernauts of the United States,

[284] Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 317: Intelligence Note RARN-7 Prepared by the Bureau of Intelligence and Research, Washington, March 2, 1972: Brazil - If Development Brings Pollution, So Be It. See also, Luiz Felipe de Seixas Correa, *Brazil in the United Nations, 1946-2011* (Brasilia: Fundacio Alexandre de Gusmao, Ministry of External Relations, 2013).

the United Kingdom, or Japan, like most of its Latin American neighbors, Brazil remained among the world's less developed countries (LDCs). Like most other LDCs, Brazil harbored aspirations of industrialization and economic improvement for self-sufficiency. Throughout the 1950s, Brazil's democratic governments pursued rapid economic growth and self-sustained national development through Import Substitution Industrialization (ISI), based on the development strategies of Argentinean economist Raúl Prebisch and Brazilian economist Celso Furtado. ISI sought to establish internal markets and induce domestic industrialization by replacing foreign imports with the local production of industrialized goods.[285]

Brazil's ISI approach combined high protective tariffs, foreign exchange controls, special inducements for foreign capital, and direct government investment in infrastructure and industry via a new government development bank. As a result, the Brazilian economy experienced relatively high growth rates from 1950 to 1961, where real GDP grew annually around seven percent. The intense ISI process bolstered Brazil's nascent industrial development, with imports dropping from 12.6 percent in 1950-1954 to 8.6 percent in 1955-1961, and yearly industrial production expanding toward ten percent. Yet this development also accentuated Brazil's unequal regional and social concentration of income, produced a balance of payments problem for the government, and sent inflation skyrocketing. By 1961,

[285] Raúl Prebisch, *The Economic Development of Latin America and Its Principal Problems* (New York: United Nations Department of Economic Affairs, 1950); Celso Furtado, *The Economic Growth of Brazil: A Survey from Colonial to Modern Times* (Berkeley: University of California Press, 1963, c1959).

when the initial ISI boom faded, Brazil's economy entered a seven-year period of stagnation.[286]

In the 1960s, Brazil's government and economy experienced dramatic changes, including a revolution and recession. Industrial decline, growing unemployment, and inflation soaring toward triple digits all escalated Brazil's economic and political instability, with extreme polarization between its radical right and left. By 1964, Brazil's industrial manufacturing output fell from an earlier high of 9.4 percent down to 0.4 percent, and its growth rate per capita slipped backward to negative three percent. In the spring of 1964, right-leaning military officers exacted a *coup d'état* to consolidate Brazil's capitalist system on the guise of preventing communist insurrection within the existing left-leaning government. As the new military regime substantially increased executive authority, Brazil's legislature lost what limited power it had. However, a class of civilian technocrats, almost all economists, colluded with the military dictatorship to redirect national economic development.[287]

Amid deepening recession, the new military and technocratic regime produced its *Government Economic Action Program, 1964-1966*, which along with inflationary control listed its primary objective as "the acceleration of economic development."[288] To move beyond the stagnant ISI policies, the ruling elite would

[286] Werner Baer, "The Brazilian Growth and Development Experience: 1964-1975," in *Brazil in the Seventies*, edited by Riordan Roett (Washington, DC: American Enterprise Institute for Public Policy Research, 1976), pp. 41-62, here 42-43; Luiz Bresser Pereira, *Development and Crisis in Brazil, 1930-1983* (Boulder, CO: Westview Press, 1984), 25-44.

[287] Pereira, *Development and Crisis in Brazil*, 84-85, 116-117, 129.

[288] Brazil Ministry of Planning and Economic Coordination, *Government Economic Action Program, 1964-1966*, Institute of Applied Economic Research (IPEA, or Instituto de Pesquisa Econômica Aplicada) Document no. 1 (November 1964), 15-17.

re-modernize Brazil first through stabilization efforts, then by export-oriented growth driven by industrial development and extensive use of Brazil's substantial natural resources. Combined with immense influxes of opportunistic foreign investment, the new economic policies eventually stabilized Brazil's economy with forced reduction in real wages, banking and tax reform, deficit decline, and eventual reduction of inflation to about twenty percent. Even under military rule, the economic crisis peaked in 1965, when unemployment in São Paulo, one of the largest cities in the Southern Hemisphere, reached 13.5 percent. But, after 1967, Brazil's economy entered a new period of expansion that Brazilian economist Luiz Bresser Pereira described as "technocratic-military interventionist liberalism" and "developmental nationalism."[289]

By 1968, Brazil's technocratic economy began reaping the benefits of a remarkable seven-year boom justifiably known as the "Brazilian miracle." Brazil had fueled its renewed development and industrialization by abandoning the ISI policies of high protective tariffs and opening up to international markets in a time of global economic expansion. The rates of Brazil's external trade grew substantially higher than growth of its economy as a whole. From 1967 to 1973, Brazilian exports increased 275 percent, especially in manufactured products, which jumped from ten to nearly 300 percent in just five years. Although the nation ran a trade deficit from higher import growth in the early 1970s, massive inflows of private foreign capital and international loans more than covered the balance. From 1965 to 1969, the annual net inflow of direct investment averaged $84 million annually; but after

[289] Pereira, *Development and Crisis in Brazil*, 112-118, 128-133, quotes on 129.

Brazil's economic stabilization and renewed growth, direct investment soared to $977 million in 1973 alone. Brazil's acceptance of net foreign loans was even higher, with an increase from an annual average between 1965 and 1969 of $604 million up to $4.5 billion in 1973.[290] Until the international oil shocks in late 1973 slowed global rates of growth, Brazil's developmental interventionism re-ordered the nation's relations to the international market, which also expanded drastically its domestic development.

The domestic effects of Brazil's re-integration with the global economy were miraculous, indeed. From 1968 and 1974, Brazil's annual real growth of GDP surged with yearly averages over ten percent. Industry led the way with yearly growth above twelve percent, including major manufacturing gains in transportation, machinery, and electrical equipment. The decade after 1964 also saw massive growth in both basic industries and consumer goods. Steel output grew from 2.8 to 8.3 million tons; electric power capacity expanded from 6.84 to 19.5 million megawatts; poured cement rose from 5.6 to 17.9 million tons; and paper production climbed from 0.6 to 1.6 million tons. The total number of motor vehicles in Brazil leapt from 184,000 to 930,000, with units of passenger cars jumping from 98,000 to 524,000. Internal development of new road construction increased from twelve percent between 1964 and 1967 to twenty-five percent in the period from 1968 to 1972, while paving rates grew from six percent in 1968 to thirty-three percent in 1974. By that same year, annual refrigerator production numbered 658,000 and

[290] Werner Baer, "The Brazilian Growth and Development Experience: 1964-1975," 47-48.

yearly television set production reached 831,000.[291] By the end of its dramatic growth spurt, Brazil had leapt from fifteenth to eighth place in global rankings for economic growth, all heavily dependent on engagement with the global market and a continuous influx of loans from international development agencies.[292]

Brazil's miracle development made it the envy of other LDCs, which in the 1960s and early 1970s had begun voicing collective critiques for industrialized nations to respect LDC sovereignty while aiding LDCs' economic development. Throughout the 1960s, in the wake of post-WWII decolonization, the character of the UN and the work of its specialized agencies evolved as newly independent and relatively poor nations increasingly used their numerical majority to ameliorate their poverty and insecurity.[293] In 1961, the UN General Assembly elected U Thant from newly independent Burma as its first secretary-general from the Third World. Under his ten-year reign, the UN declared the 1960s as the Development Decade and set a target for five percent average annual growth of national income in developing countries. In 1964, to better integrate LDCs into the world economy and improve the terms of their international trade, LDCs established and held regular meetings of the United Nations Conference on Trade and Development (UNCTAD). In 1966, the UN's Expanded Program of Technical Assistance and its Special Fund for investment and economic growth were merged into the United Nations Development

[291] Werner Baer, "The Brazilian Growth and Development Experience: 1964-1975," 46-48.

[292] Sofia Friedman, *Brazil 1960-1990: Structures of Power and Processes of Change* (New York: University Press of America, Inc., 2003), 53-55.

[293] Stephen D. Krasner, *Structural Conflict: The Third World Against Global Liberalism* (Berkeley: University of California Press, 1985); Glenda Sluga, "The Transformation of International Institutions: Global Shock as Cultural Shock," in *The Shock of the Global: The 1970s in Perspective*, edited by Niall Ferguson, Charles S. Maier, Eraz Manela, and Daniel J. Sargent (Cambridge, MA: Harvard University Press, 2010), 223-236.

Program (UNDP). Other agencies and commissions were established in the 1960s to deal with LDCs challenges, both UN-directed and autonomous, including the UN Institute for Training and Research (UNITAR), the UN Industrial Development Organization (UNIDO), the International Finance Corporation (IFC), and the International Development Association (IDA).[294]

Additionally, throughout the 1960s, LDCs pushed the UN General Assembly to pass repeated resolutions reaffirming the inalienable right of all countries, but especially LDCs, to exercise permanent sovereignty over their natural resources in the interest of their national development. Nico Schrijver noted that the LDCs "actively pursed the implementation of the principle of permanent sovereignty over natural resources because they perceived this to be a main basis for their economic development and for a redistribution of wealth and power in their relations with the industrialized world."[295] The LDCs wanted sovereign control over their environmental goods, but like Brazil's military-technocratic regime, they required international support to enable their use and inducement of industrial development.

By 1968, the LDCs had gained significant traction in international organizations, and some, like Brazil, began showing extreme promise with rapid development. Despite discouraging early returns during the Development Decade, as the decade progressed, global economic growth accelerated. Brazil and other LDCs

[294] "United Nations," *ISSUES* No. 5: U.S. Department of State Publication 8553, International Organization and Conference Series 93 (October 1970), 25.

[295] Nico Schrijver, *Sovereignty Over Natural Resources: Balancing Rights and Duties* (Cambridge, UK: Cambridge University Press, 1997), 82. See, for example, United Nations General Assembly Resolutions 1803 (XVII) of December 14, 1962, 2158 (XXI) of November 25, 1966, 2386 (XXIII) of November 19, 1968, 2626 (XXV) of October 24, 1970, and 2692 (XXV) of December 11, 1970.

thus felt apprehensive when, in the spring of 1968, the Swedish government followed through on earlier suggestions to launch a formal initiative for the UN to host in Stockholm a global conference on the environment. The Swedish initiative aimed to explore, among other issues, whether industrialization threatened humanity's future survival on Earth.[296] Would sudden international awareness and concern about the environment create new limitations on international trade and finance? Would it impose added barriers to LDCs' natural resource use and industrial development? Would Brazil's new military regime, which predicated its rule on industrial growth, face new environmental restrictions for the influxes of foreign capital and economic development on which it depended?

Brazil Upends Environmental Perceptions

Brazil's military regime, which tied tautly its notions of national security to the growth of its new export-oriented and international finance-dependent economy, saw industrialized nations' responses to the environmental revolution as grave threats. New domestic policies establishing environmental standards in industrialized nations might negatively affect the cost of Brazil's exports and sales in those wealthy markets. Instituting environmental considerations into foreign aid and international development projects might limit the capital flows Brazil and other LDCs had grown increasingly reliant upon. If the UN were to initiate international conventions to inaugurate global environmental standards or create international controls on natural

[296] Maria Ivanova, "Moving Forward by Looking Back: Learning from UNEP's History" in *Global Environmental Governance: Perspectives on the Current Debate,* edited by Lydia Swart and Estelle Perry (New York: Center for UN Reform Education, 2007), 26-47.

resource use, it would not only directly challenge Brazil's national sovereignty but also threaten Brazil's pell-mell efforts toward further industrialization. For other LDCs, global standards and environmental conventions might completely foreclose their opportunities to even initiate industrialization. Worse yet, suggestions among growing publics in the global North to end economic growth and completely reconsider economic relations threatened to freeze international economic hierarchies and relegate LDCs to permanent positions of inferiority. With none of these possibilities acceptable, Brazil's government launched a concerted counter-attack within the UN to limit discourse and forestall action against environmental limits.

By 1970, the explosive growth of the Brazilian economic miracle reasonably qualified Brazil as an "emerging power." In the UN, Brazil projected this image in a bid for LDC leadership with aspirations to be a great power.[297] Though it clashed with the UN's new environmental obsessions, Brazil sought to keep and control international politics within the UN as a means to shift global power dynamics on its axis from East-West to South-North. In the era of Cold War détente, Brazil sought to use the UN, with its majority membership of Southern LDCs, as an institutional alternative to the power politics that, for decades, had split along the North's East-West divide. In September 1970, General Debate would open for the UN General Assembly's twenty-fifth session with several important deliberations on its docket. Foremost consideration would go toward an official development strategy for the UN's Second Development Decade. The twenty-fifth session also aimed to outline

initial plans for the approaching yet thoroughly unplanned UNCHE. That September, in preparation for the General Debate and in light of its suspicions that environmentalism was a Trojan horse for antidevelopment policies, Brazil's Foreign Ministry Office prepared a special working paper on the subject of the "Human Environment."[298] This working paper laid the outlines of Brazil's anti-environmental counter-attack and, in the words of historian Iris Borowy, set the stage "for years of acrimonious debate on the relationship and relative priority of environment and development."[299]

Brazil's working paper demanded explicitly that any environmental policies not limit economic development for developing nations, and it rejected global environmental standards on the grounds that environmental conditions were not globally uniform. Although Brazil acknowledged some industrial centers in the developed world had experienced a recent "imbalance of ecology," it emphasized that, in the developing world, "the problem differs both in characteristics and in intensity and, as a consequence, solutions and priorities cannot be the same." For instance, Brazil's nascent industrialization had not yet experienced the extent of environmental hazard as in industrial centers of Northern nations. Unplanned development may have caused ecological imbalance in the North, the Brazilian paper acknowledged. But, it maintained that wherever environmental problems

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[297] Luiz Felipe de Seixas Correa, *Brazil in the United Nations, 1946-2011* (Brasilia: Fundacio Alexandre de Gusmao, Ministry of External Relations, 2013), 335.

[298] Brazil, "Working Paper 40: Human Environment," September 1970, H/II/86/3, Archives of the World Health Organization, Geneva, Switzerland. My thanks to Iris Borowy for finding and sharing this document.

[299] Iris Borowy, "Global Health and Development: Conceptualizing Health between Economic Growth and Environmental Sustainability," *Journal of the History of Medicine and Allied Sciences* 68:3 (July 2013), 451-485, here 462.

might exist in LDCs, "it is easy to trace it back to its origins: the condition of underdevelopment itself." Policy solutions to international environmental challenges therefore needed rethinking. "Instead of being a justification for *stagnation*," Brazil maintained, "environmental policies can only be meaningful if planned in the context of *development*." In fact, Brazil claimed, a nation in the early stages of development and industrialization might, "in spite of less desirable environmental effects," require polluting production processes to fulfill its priority development targets.[300] By invoking the perspective of the global South, Brazil had turned the environmental revolution on its head. Rather than identify economic development as the cause of environmental problems, Brazil proclaimed poverty and the lack of development as the real environmental hazard for most of the world.

Brazil's working paper preemptively rejected possible efforts at the upcoming UNCHE for global environmental standards or the establishment of planetary nature reserves. To Brazil, the increased "insistence upon drafting conventions, recommendations, and agreements" for the global environment reflected "the predominant philosophy of enforcing in the developing countries a 'hands off' policy ultimately designed to freeze the process of development and deny the same countries the right to exploit freely their own natural resources." With its treasure trove of Amazonian resources, Brazil rejected any external attempts to legally restrict access to its own sovereign assets. Brazil also repudiated the notion that unique or ecologically essential areas of the world—like its Amazonian regions—should become "preserves of unspoiled nature, capable of compensating

[300] Brazil, "Working Paper 40: Human Environment," September 1970. Emphasis in original.

the pollution factors lavishly created in the developed countries." To Brazil, such notions seemed "a new 'justification' of underdevelopment which is obviously unacceptable." In fierce protection of its national sovereignty, Brazil maintained that any action taken in the field of natural resources was "only conceivable as an internal measure," not to be forced through external interference or pressure.[301]

Brazil's working paper established a crucial precedent in international environmental debate. For solving international environmental issues, the Brazillian paper declared, "An economic and not a juridical approach should prevail." Since Brazil defined the unequal distribution of wealth as the basis for environmental problems in LDCs, and since it deemed development as the solution to this problem, Brazil sought to ensure the flow of foreign capital for achieving its developmental goals. In the process, Brazil introduced what has since become a major sticking point in international environmental diplomacy: the concept of environmental additionality. Additionality in this early context argued that wealthy nations must maintain their established commitments to international development, but when corrective environmental measures are required in the LDCs, the rich nations should provide *additional* resources and aid for environmental amelioration.[302] After all,

[301] Brazil, "Working Paper 40: Human Environment," September 1970.

[302] For the evolution of the environmental consideration of additionality in Climate Change negotiations and carbon markets, see K. Baumert, *The Clean Development Mechanism: Understanding Additionality* (Washington, DC: Center for Sustainable Development in the Americas, 2000); M. Dutschke and A. Michaelowa, "Development Assistance and the CDM--How to Interpret 'Financial Additionality,'" *Environment and Development Economics* 11 (2006): 235-246; A. Michaelowa, "Intrepreting the Additionality of CDM Projects: Changes in Additionality Definitions and Regaulatory Practices over Time," in *Legal Aspects of Carbon Trading*, edited by D. Freestone and C. Streck (Oxford, Oxford University Press, 2009), 248-271; Steven Ferrey, "When 1 + 1 No Longer Equals 2: The New Math of Legal 'Additionality' Controlling World and U.S. Global Warming Regulation," *Minnesota Journal of Law, Science & Technology*, Vol. 10 (2009), Suffolk University Law School Research Paper No. 10-48.

Brazil argued, all environmental problems trace their roots back to the industrialized nations. With their comparative wealth, should not the rich industrial nations pay to clean up the mess they created? Brazil's foundational paper on international environmental action argued, in sum, that,

> [P]olicies for the protection of the environment must be planned as a means to promote development and not as an obstacle and a barrier to the rising expectations of the underdeveloped world. They must be defined also clearly in terms of redressing an ill-conceived pattern of geographic distribution of economic activities and of channeling to the developing world the additional resources it will need both to offset the detrimental effects its environment has already endured … and to pay for the economic transformations that might be required.[303]

In the final months of 1970, in the midst of the industrialized world's environmental revolution, Brazil's platform defined the bounds of environmental political-economy not just for the UNCHE, but for environmental diplomacy over the next several decades. And in the coming months of UN debate and UNCHE planning, Brazil welcomed every occasion to collect LDC support to its point of view.

Since the UN's first Special Session in 1947, every September, a Brazilian representative has accepted the honor of opening General Debate in the UN General Assembly. On September 17, 1970, Mario Gibson Alves Barboza, Brazil's new head Minister of State for Foreign Affairs, opened the twenty-fifth session of the UN General Assembly in New York. Barboza emphasized the importance of elaborating a clear strategy for the UN's Second Development Decade. Yet he expressed Brazil's concern that the existing system of international economic cooperation for

[303] Brazil, "Working Paper 40: Human Environment," September 1970.

development seemed torn between two possible futures. The world must choose, Barboza declared, "between a 'strategy of stability,' designed only to maintain the indices of poverty at their present levels, or a 'dynamic strategy' of development." Barboza chastised the strategy of stability as one of stagnation that laid the greater objective of development on a sacrificial altar of localized goals and controls. Brazil, he continued, of course favored the dynamic strategy of growth for the UN's majority LDCs—a strategy designed with both global and sectoral goals "to increase their GNP so significantly as to narrow the income gap between the North and the South." Barboza celebrated Brazil's recent economic successes, but on behalf of other LDCs, he expressed Brazil's "doubt as to the possibility of developing countries as a whole finding viable formulas for economic and social progress if we have a continuation of present tendencies towards stagnation in the flow of trade and of economic cooperation."[304]

Though Brazil's Minister of State never mentioned environment or ecology in his speech, he ensured UN debate opened in assault on any strategies—environmental or otherwise—that sought to freeze international development and economic growth. Members of Brazil's Foreign Ministry repeated this argument regularly as UNCHE planning finally and rapidly advanced. As a member of the twenty-seven-nation UNCHE Preparatory Committee, Brazil would ensure the conference endorsed its perspective, or it would work so that no conference would occur at all.

[304] Mario Gibson Alves Barboza, Speech before the XXV Session of the UN General Assembly, September 17, 1970, in Luiz Felipe de Seixas Correa, ed., *Brazil in the United Nations, 1946-2011* (Brasilia: Fundacio Alexandre de Gusmao, Ministry of External Relations, 2013), 344-345.

Strong's UNCHE, Where Process Is Policy

In next month, October 1970—as environmental representatives of the Nixon and Sato administrations exchanged ideas on environmental controls in Tokyo—the twenty-fifth session of the UN General Assembly and its majority of LDCs confirmed their focus on economic development. Among the UN's earliest actions that term included General Assembly Resolution 2626, which declared the 1970s as the Second UN Development Decade beginning that coming January 1971. The resolution also outlined an ambitious international development strategy with an average annual growth-rate goal of "at least six percent, with the possibility of attaining a higher rate in the second half of the Decade."[305]

Just as significant, UN Secretary-General U Thant appointed Canadian businessman and international development administrator Maurice Strong to become Secretary-General of the future UNCHE. In November, Strong accepted responsibility for planning the world's first intergovernmental summit on the world environment, and he soon established a Conference Secretariat to support his monumental task. In light of Brazil's admonitions against any encroachment on economic growth, the UN's appointment of Strong sought to sooth LDC concerns over potential conflicts between development and environment.

Maurice Strong, who was born in Canada in 1929, developed a profound interest in money as a child during the Great Depression. In 1945, at age sixteen, Strong fled school for an apprenticeship as a fur trader with the Hudson's Bay

Company. While still a teenager, Strong and fellow prospectors founded a mining company before he returned to Toronto and worked in stock promotion. In 1947, having read the text of the Atlantic Charter with fascination, Strong briefly worked at the UN in New York as a minor bureaucratic assistant. He realized, however, the UN was no place to start low and climb up. He returned to Canada where he resumed stock analysis and oil exploration. By age twenty-three, Strong had made a fortune and gotten married. For two years, Strong and his new wife explored the world. In East Africa, he took a job with an oil company opening gas stations, and he founded another mining operation. Strong's travels through LDCs inspired him, upon his return, to seek work from international development agencies; but without a university degree, no agency accepted him. Then twenty-five, Strong returned to the business world of natural resource exploration and exploitation. Over the next several years, Strong made another substantial fortune, eventually becoming President of the Power Corporation of Canada.[306]

In 1966, Strong fulfilled his international development desires when Canada's Prime Minster invited Strong to head Canada's External Aid Office. Strong accepted, renamed it the Canadian International Development Agency, and greatly increased both the quantity and quality of Canadian aid. As a Deputy Minister in the Canadian government, the new position afforded Strong opportunities

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[305] UN General Assembly resolution 2626 (XXV) "International Development Strategy for the Second United Nations Development Decade," October 24, 1970.

[306] The paragraph draws from Jennifer Clapp and Peter Dauvergne, *Paths to a Green World: The Political Economy of the Global Environment* (Cambridge, MA: MIT Press, 2005), 55; Peter Stone, *Did We Save the Earth at Stockholm?* (London: Earth Island Ltd., 1973), 20-23; Wade Rowland, *The Plot to Save the World: The Life and Times of the Stockholm Conference on the Human Environment* (Toronto: Clarke, Irwin, & Co. Ltd., 1973), 35-37. See also Maurice Strong, *Where on Earth Are We Going?* (New York: Alfred Knopf, 2000).

to sharpen his political sensibilities as well as work closely with key personalities in the world of international development.[307] By the time Strong accepted responsibility for organizing the UNCHE in 1970, he had spent more than two decades either developing natural resources or encouraging the economic development of LDCs. Strong believed scientists' warnings that environmental degradation threatened the natural foundations of economic growth, and with it, the long term stability of human survival. But he remained equally convinced that any solutions to international environmental challenges must occur within the socio-economic contexts of international development.[308] Strong's background proved essential for encouraging UNCHE participation from all nations, especially LDCs.

Strong, renowned for boundless energy, knew he had much work to do to achieve a successful UNCHE. By late 1970, with the UNCHE barely a year and half away, conference preparation had fallen far behind schedule. Strong still needed to staff a competent and globally balanced Conference Secretariat with experts who hailed from beyond just North American and Western Europe. Additionally, suitable subjects for formal discussion at the conference needed finalizing; national State-of-the-Environment reports needed drafting, collection, and analysis from participating nations; and environmental action proposals that stood a chance at passage still needed adoption.[309] Strong's first priority, however, remained ensuring planetary participation in the UNCHE, not merely from the industrialized nations who had first called for its creation.

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[307] Ibid.
[308] Maurice Strong, *Where on Earth are We Going?* (New York: Alfred Knopf, 2000), 122.
[309] Stone, *Did We Save the Earth at Stockholm?*, 20.

At that time, several LDCs, with Brazil's encouragement, had threatened to boycott the UNCHE.[310] In late 1970, the tentative issues on the conference agenda focused on controlling industrial pollution and promoting conservation. The LDCs, as Strong later recalled, feared the UNCHE's "preoccupation with the environmental 'fad' would deflect attention and resources from their first priority of dealing with the critical problems of poverty and underdevelopment." As such, Brazil and other boycott-threatening nations saw environmental concerns about excess industry as a "rich-man's" problem. Additionally, Strong added, LDCs "worried…that industrialized countries might seek to impose new constraints on developing counties in the name of environment."[311] Strong moved quickly to quell those concerns.

In early November 1970, Strong formed a small but dedicated UNCHE Secretariat who brainstormed concrete steps to facilitate the active participation of LDCs. The UNCHE Preparatory Committee, which included Brazil, planned to meet informally that month. And soon after, the Second Committee of the UN General Assembly would debate a new resolution concerning UNCHE planning. With the new possibility that many of the world's LDCs—that is, most of the world's nations—might avoid the conference, Strong had to capture their attention and somehow promote their interests in participating. His solution involved investing nations in an intricate planning process where LDC voices would have numerous

[310] Maurice Strong, "Stockholm Plus 30, Rio Plus 10: Creating a New Paradigm of Global Governance," in James Gustave Speth, ed., *Worlds Apart: Globalization and the Environment* (Washington, DC: Island Press, 2003), 33-50, here 35.

opportunities to shape the Conference proceedings. Strong believed the preparatory process could be as important as the actual results of the Conference. Intricate preparations by numerous participants could gradually increase the quality and level of consensus. In that way, the preparatory process itself would produce a result satisfactory to all. With such a process, the UNCHE's greatest conflicts and even its ultimate results might be mainly secured before the Conference even began. In short, Strong placed faith in a formula where "the process is the policy."[312]

In their early November meeting, Strong and his Secretariat explored several possibilities to invest LDCs in his planning process. One idea included "establishing a small panel of well known personalities in the field of development and developing countries." This panel could then take responsibility for preparing a report that addressed LDC concerns on reconciling economic development with international environmental issues. Notes from Strong's meeting made explicit that the selected experts "should work in a developing country e.g. Brazil."[313] Strong knew early on that the UNCHE required incorporation of Brazil's perspective on the human environment, and preferably, Brazil's participatory leadership. Days later, at the informal Preparatory Committee meeting, Strong formally accepted his appointment as Secretary-General of the UNCHE and announced a new emphasis that would

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[311] Maurice Strong, "Stockholm Plus 30, Rio Plus 10: Creating a New Paradigm of Global Governance," in *Worlds Apart: Globalization and the Environment*, edited by James Gustave Speth (Washington, DC: Island Press, 2003), 35.

[312] Christian Herter, Jr., and Jill Judy, *The Role of the Secretariat in Multilateral Negotiation: The Case of Maurice Strong and the 1972 U.N. Conference on the Human Environment* (Washington, DC: Foreign Policy Institute, Paul H. Nitze School of Advanced International Studies, Johns Hopkins University, 1993), 21.

[313] "Notes on Questions that May Be Raised at the Informal Meeting of the Preparatory Committee," November 6, 1970, Sergio Viera de Mello Library, Digitized Stockholm Documents,

place environmental policies firmly within "the socio-economic context of development."[314]

Later that month in New York, on November 24, 1970, Strong opened the UN General Assembly's first substantial discussion on the UNCHE since he accepted appointment as its Secretary-General. In a bid to capture global participation, Strong first announced to UN members that "the relationship between environment and development" constituted "his most important concern in relation to his new responsibilities." In a direct challenge to the First-World-first environmental advocacy of George Kennan, Strong argued that the UN was "the proper, indeed the only forum" to resolve potential disharmony between development and environmental considerations.[315] The global implications of that debate, he argued, required global participation. Next, Strong outlined his vision for how UNCHE preparatory work would.

Strong planned for conference activities to proceed at three levels. First, on a broad conceptual or intellectual level, he would call upon the world's scientific and intellectual community to compose the first global "report on the state of the environment," which would define major areas of environmental consensus, identify major gaps in knowledge, and indicate for political leaders priority issues where action should proceed. This later became the book authored by Strong's friend and

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Before the Conference, http://www.unlibrary-nairobi.org/PDFs/Notes_committee.pdf, accessed January 2, 2014.

[314] Maurice Strong, *Where on Earth Are We Going?* (New York: Alfred Knopf, 2000), 122. See also Lars-Göran Engfeldt, *From Stockholm to Johannesburg and Beyond: The Evolution of the International System for Sustainable Development Governance and Its Implications* (Stockholm: Ministry for Foreign Affairs, report no. 09-064, 2009).

colleague, Barbara Ward, with the support of Pulitzer-Prize winning microbiologist René Dubos titled, *Only One Earth.*[316] Second, in what Strong envisioned as the bulk of preparatory work for the conference, he said preparatory members would draft a preliminary Action Plan with specific measures that nations would approve during the conference and could implement in the post-Stockholm period. Ideally, the Action Plan would provide an agreed-upon international basis for environmental priorities and the allocation of resources to meet them. Finally, for the third level, Strong saw the UNCHE as a site for the "ratification of relevant conventions, treaties, or agreements" on the international environment. Despite Brazil and other LDCs' distain, Strong still hoped UNCHE preparatory work could outline the shape of global environmental accords. To conclude, Strong reiterated that "the Conference should be conceived of not as an end in itself but as part of a process"—a process that had begun before the UNCHE and would continue after it, but both, he hoped, with global participation.[317]

After Strong finished, other nations enlivened the debate. Sweden, the future host for the UNCHE, spoke first to celebrate Strong's new leadership. Sweden also underscored how the conference must "result in substantive action and not be confined to speeches." Sweden intended the conference to confront and resolve environmental threats to the very survival of humankind. Sweden therefore reprised

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[315] United Nations General Assembly (XXV), *Second Committee, Provisional Summary Record of the One Thousand Three Hundred and Fiftieth Meeting: United Nations Conference on the Human Environment*, *New York, November 24, 1970*, A/C.2/SR.1350 (November 30, 1970), 2.

[316] Barbara Ward and René Dubos, *Only One Earth: The Care and Maintenance of a Small Planet* (New York: W.W. Norton, 1972).

[317] Maurice Strong quoted in United Nations General Assembly (XXV), *Second Committee, Provisional Summary Record of the One Thousand Three Hundred and Fiftieth Meeting: United*

its emphasis on controlling the problems of growth and industrialization. The environmental crisis arose, Sweden declared, "from the fact that the environment had been neglected in the early days of the process of industrialization." As such, notions of economic growth required reconsideration for more qualitative aspects, less on the quantitative side. Somewhat aghast, the Czech ambassador retorted that "there could be no question of Czechoslovakia's reducing its economic growth rate when its people were just beginning to experience the well-being derived from economic development." Environmental action and economic growth "had to be pursued simultaneously," Czechoslovakia declared.[318] In this ripe moment, Brazil's seasoned ambassador, João Augusto de Araújo Castro, stood to address the General Assembly debate.

Before the military coup took over Brazil's government in 1964, Araújo Castro had served as Brazil's head Minister of State for Foreign Affairs under soon-to-be disposed President João Goulart. In 1968, after four years of ostracism, Araújo Castro returned in full commitment to Brazil's new military-technocratic leadership to become Brazil's ambassador to the United Nations. Ruben Ricupero, another career diplomat in Brazil's Foreign Ministry and later secretary-general of UNCTAD, described Araújo Castro as "perhaps the most influential thinker Brazil has had in foreign relations."[319] Araújo Castro was a strong critic of what he called

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Nations Conference on the Human Environment, *New York, November 24, 1970*, A/C.2/SR.1350 (November 30, 1970), 2-3.

[318] United Nations General Assembly (XXV), *Second Committee, Provisional Summary Record of the One Thousand Three Hundred and Fiftieth Meeting: United Nations Conference on the Human Environment*, *New York, November 24, 1970*, A/C.2/SR.1350 (November 30, 1970), 4, 9.

[319] Interview of Ruben Ricupero by Yves Berthelot (March 13 and 18, 2003), *United Nations Intellectual History Project: The Complete Oral History Transcripts from* UN Voices. CD-ROM, 2007.

the UN's freezing of the structures of international power in 1945 and from the ensuing development of the Cold War. Araújo Castro wanted Brazil to break through those structures to take its places as a new global power. Later, in the spring of 1971, Araújo Castro accepted an influential position as Brazil's ambassador to the United States; but in the environmental moment of November 1970, he arose within the UN to elucidate Brazil's position on global environmental issues and the UNCHE.

At the dawn of a new UN Development decade, Araújo Castro announced that for Brazil and other LDCs, nearly all challenges—including environmental ones—found solution in greater development, not environmental protection. Brazil, he made clear, refused to "sacrifice the standards of living of its population through economic restrictions dictated by environmental policies." Despite rumors to the contrary, Brazil did not seek a boycott and believed the UNCHE should be "truly global in scope." But Brazil strongly rebuffed any efforts toward "uniform measures" for environmental standards. Environmental policies, Araújo Castro argued, were not subject to international debate; rather, such action "fell under the exclusive and sovereign jurisdiction of the countries concerned" and depended on their sovereign needs and interests. Global dialog was important, but global standards made no sense. "It was essential from the outset," Araújo Castro explained, "to take into account the specific problems of the environment in the developing countries." Where they existed, LDC environmental problems included

issues like soil erosion, deforestation, unclean water, and urban concentration. For LDCs, Araújo Castro declared, "development was the only solution."[320]

Toward that end, Araújo Castro also reiterated Brazil's claims for additionality. "The developed countries," he stated, "should earmark additional financial and technical aid to assist developing countries in the context of future international cooperation for the protection of the environment." International cooperation should be directed towards correcting economic policies which had harmful repercussions in the developed countries." In sum, Araújo Castro concluded that Brazil "was opposed to international measures which did not take account of the special needs of the developing countries … and to proposals which ignored the responsibility of the developed nations for the imbalance caused by current patterns of international trade or the economic and financial obligations they incurred as a result."[321] Brazil welcomed Maurice Strong as new Secretary-General of the UNCHE, namely because of his development experience. Araújo Castro made clear, however, that while the Earth may be one, the world was not.

Within weeks, the UN General Assembly passed several new resolutions reflecting LDCs' growing realization that the UNCHE would have institutional implications requiring their input. On December 7, 1970, the General Assembly refined plans for the upcoming UNCHE with resolution 2657. While the resolution

[320] João Augusto de Araújo Castro quoted in United Nations General Assembly (XXV), *Second Committee, Provisional Summary Record of the One Thousand Three Hundred and Fiftieth Meeting: United Nations Conference on the Human Environment*, *New York, November 24, 1970*, A/C.2/SR.1350 (November 30, 1970), 12.

[321] João Augusto de Araújo Castro quoted in United Nations General Assembly (XXV), *Second Committee, Provisional Summary Record of the One Thousand Three Hundred and Fiftieth Meeting: United Nations Conference on the Human Environment*, *New York, November 24, 1970*, A/C.2/SR.1350 (November 30, 1970), 12-13.

encouraged continuation of "vigorous" conference preparations, it stressed the need that preparations "should be considered in the context of economic and social development, taking into account the special needs of development in developing countries." The resolution also stated the UNCHE Preparatory Committee would meet officially in February 1971 and again in September 1971. For those UNCHE planning meetings, the resolution required inclusion of new and specific agenda items to "safeguard and promote the interests of developing countries." It also encouraged the UNCHE Preparatory Committee to address the financing of "additional resources" to LDCs in the context of their environmental protection.[322]

To further ensure the sacredness of economic development despite possible environmental protections, the UN General Assembly passed yet another resolution on the sovereign use of natural resources—this time with explicit focus on LDCs' economic development. Resolution 2692, passed on December 11, 1970, declared "Permanent Sovereignty over Natural Resources of Developing Nations and Expansion of Domestic Sources of Accumulation for Economic Development." For additional protection of national sovereignty in environmental planning, the UN General Assembly also moved to avoid discussion of population problems at the 1972 UNCHE by declaring 1974 as World Population Year, when it would host a separate conference on population issues.[323]

[322] UN General Assembly resolution 2657 (XXV) "United Nations Conference on the Human Environment," December 7, 1970.

[323] UN General Assembly resolution 2692 (XXV) "Permanent Sovereignty over Natural Resources of Developing Nations and Expansion of Domestic Sources of Accumulation for Economic Development," December 11, 1970; UN General Assembly resolution 2683 (XXV) "World Population Year," December 11, 1970.

If the environmental revolution had reordered economic considerations in some industrialized nations, Brazil had positioned itself to reorder the UNCHE preparatory process. Given Maurice Strong's new leadership in which "the process is the policy," that meant Brazil's environmental arguments might ultimately define the UNCHE's eventual achievements. But only if Strong could get LDCs to attend the UNCHE, and then, only if Brazil could rally other LDCs to embrace its arguments about the centrality of development despite continued concerns in the global North by vocal environmental experts about environmental survival on Spaceship Earth.

Two Sides of the Global Coin

In January 1971, the month after the UN resolutions demanded the UNCHE better account for LDC needs, Maurice Strong met with two very different groups of experts whom he hoped could both promote and inform UNCHE planning.[324] Strong's two meetings that January reflected opposite sides of the debates over the need for global environmental protection, and the need for advancing global economic development.

First, Strong met with a group of MIT scientists working on computer simulation projects for an atypical international group called the Club of Rome. The second group of experts Strong met that January included a select core of leading developmental economists, most of who came from LDCs. Each of the two groups held drastically opposing views about global environmentalism and the role of economic growth and development within it. In that still-early phase of the UNCHE

planning process, Strong's meeting with both groups signaled that the UNCHE might yet move in any number of directions.

The MIT scientists Strong met included entrepreneurial expert on energy and management, Carroll Wilson, and pioneering computer engineer, Jay Forrester, both professors in MIT's Sloan School of Management, as well as Donella Meadows, a former student of Forrester's and an expert on systems dynamics. Both Forrester and Meadows were then conducting computer-modeling projects funded by the Club of Rome—a loose, independent, and international assortment of industrialists, intellectuals, political leaders, economists, and scientists that included both Wilson and Strong as members. A wealthy Italian industrialist named Aurelio Peccei, who had grown increasingly concerned about the interconnections of global crises and their ecological implications, had founded the Club of Rome in that revolutionary year of 1968. Since then, Peccei and other Club of Rome members sought solutions to what they called the "world *problématique*"—an array of global, systemic problems they believed threatened the future survival of humankind.[325] In addition to their membership in the Club of Rome, Wilson served as a key scientific advisor for

[324] Steven F. Bernstein, *The Compromise of Liberal Environmentalism* (New York: Columbia University Press, 2001).

[325] For more on Aurelio Peccei, the Club of Rome, the projects it funded, and their effects on science and politics see Aurelio Peccei, *The Chasm Ahead* (New York: Macmillan & Co., 1969); Robert Lilienfeld, *The Rise of Systems Theory: An Ideological Analysis* (New York: John Wiley & Sons, 1978), 234-246; John McCormick, *The Global Environmental Movement* (West Sussex, UK: John Wiley & Sons, 1995), 90-96; Fernando Elichirigoity, *Planet Management: Limits to Growth, Computer Simulation, and the Emergence of Global Spaces* (Chicago: Northwestern University Press, 1999); Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (Cambridge, MA: MIT Press, 2010), 366-372; Paul Sabin, *The Bet: Paul Ehrlich, Julian Simon, and Our Gamble over Earth's Future* (New Haven: Yale University Press, 2013), 80-93.

Strong. And Strong already appreciated Wilson's earlier work in organizing world-scale environmental research reports.

In 1970, Wilson had organized the Study of Critical Environmental Problems (SCEP)—a month-long meeting of various scientists to explore humanity's impact on the global environment. Following the meeting, Wilson produced an interdisciplinary report as a scientific contribution to the UNCHE planning process, including ideas relevant to LDCs. First, the SCEP emphasized that the existence of a global environmental problem did not imply the need for a global solution. Remedial environmental action, it suggested, might best proceed at regional, national, or local levels. Although, as might be expected from a group of scientists, the report underscored the importance of international cooperation in environmental research and global monitoring, especially since the existing global data remained fragmentary and sometimes unreliable. The SCEP also noted that rich and poor nations should necessarily have different perspectives on environmental problems. It argued that, at that point, most LDCs had few reasons to shift their attention from industrial development to the environment. For the "foreseeable future," it advised, "the advanced industrial societies will have to carry the load of remedial action against pollution."[326] Though informative and credible, that declaration did little to help Strong's recruitment of LDCs to the UNCHE.

Strong met with Wilson and his MIT colleagues in January 1971, in part, to discuss Wilson's organization of another month-long meeting of scientists: the Study

[326] Study of Critical Environmental Problems, *Man's Impact on the Global Environment: Assessment and Recommendation for Action* (Cambridge, MA: MIT Press, 1970), 253; John

of Man's Impact on Climate (SMIC).[327] Wilson would hold the meeting later in 1971, where several of the world's leading atmospheric scientists examined humanity's role in the inadvertent modification of the global climate. Wilson produced another report on the SMIC. Both the SCEP and SMIC reports helped bolster the scientific credibility of the UNCHE, and in light of limited global-scale environmental data, both endorsed expansion of global monitoring programs, which the UNCHE later established.[328] Scientists and policymakers still cite Wilson's studies as key events in spurring early political awareness of anthropocentric climate change.[329] But back in January 1971, Strong also wondered whether the work that Wilson's MIT colleagues were doing for the Club of Rome might help rally LDCs, or at least help promote the UNCHE's effort to expand global environmental understanding.

Jay Forrester and Donella Meadows, then working with the Systems Dynamics Group at MIT, explained that their studies supported by the Club of Rome had serious implications for LDCs, but would not likely inspire their excitement for global environmental action. Forrester and Meadows's work incorporated innovative computer models of industrial pollution, population, food production and other

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McCormick, *The Global Environmental Movement* (West Sussex, UK: John Wiley & Sons, 1995), 91-92.

[327] Study of Critical Environmental Problems, *Man's Impact on the Global Environment: Assessment and Recommendation for Action* (Cambridge, MA: MIT Press, 1970); Study of Man's Impact on Climate, *Inadvertent Climate Modification: Report of the Study of Man's Impact on Climate* (Cambridge, MA: MIT Press, 1971).

[328] Among the tangible results to emerge from the UNCHE action plan was creation of an environmental assessment program called "Earthwatch," which meant to review the world environmental situation to enable for proper government consideration of emerging environmental problems. See "Earthwatch, 1971-1992," http://www.un.org/earthwatch/about/docs/annrpt92.htm, accessed January 19, 2014.

global systems to better understand the nature of planetary-scale crises. Despite LDC desires for the contrary, the MIT computer models suggested societies should shift away from industrial growth and transition toward a state of global equilibrium. Forrester was then writing a technical book on the subject, which he expected would appear in the summer of 1971. Meadows expected her draft for the Club of Rome, which sought a more mainstream audience, would appear prior to the UNCHE in 1972. In the meantime, during their meeting with Strong, the MIT researchers helped sketch a slogan to promote what they saw as the UNCHE's purpose: "to protect and enhance the environment for present and future generations."[330] Strong liked the slogan's consideration of subsequent generations. But given his need for LDC inclusion in the UNCHE, and given the research conclusions from the scientists who drafted it, Strong couldn't help but note the slogan's failure to incorporate economic development into environmental issues.

Later that month, also in January 1971, Strong met with a different group of experts with very different priorities. Strong hoped this second set of experts could help him better incorporate LDC perspectives on the environment into the UNCHE planning process, and thereby encourage greater LDC participation in Stockholm. Strong had asked his British friend and well-connected developmental economist Barbara Ward to convene a small group of leading development experts. Strong hoped they could "help us think through how the Conference process and agenda

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[329] Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (Cambridge, MA: MIT Press, 2010), 361-362.

[330] Christian Herter, Jr., and Jill E. Binder, *The Role of the Secretariat in Multilateral Negotiation: The Case of Maurice Strong and the 1972 U.N. Conference on the Human Environment*

could be re-cast to accommodate developing country concerns."[331] Though from the global North, Barbara Ward was widely respected as a champion of LDC interests. Ward invited a core group of leading LDC economists including Uruguay's Enrique Iglesias, Columbia's Rodrigo Botero, Kuwait's Abdlatif Y. Al-Hamad, and Pakistan's Mahbub ul Haq—who later became a World Bank vice president, served as finance minister of Pakistan, and helped design the human develop index for the United Nations Development Program.[332] Strong also invited Gamani Corea, a developmental economist and diplomat from Ceylon (soon renamed Sri Lanka). Corea, who later became Secretary-General of the UNCTAD, had worked in 1964 during planning for the first UNCTAD with Argentinean economist Raúl Prebisch, whose theories on economic dependency helped inspire formation of the Group of 77 (G-77). As a diffuse coalition of seventy-seven LDCs in Africa, Asia, and Latin America, the G-77 aimed to promote their collective economic interests in negotiations with industrialized countries. Corea had written the first ever declaration of the G-77. The economic experts Strong assembled that day had, and continued to have, strong influences over developmental governance.

In Strong's New York office at the UN, he explained his hope that the assembled LDC economists might, according to Corea, "have a little group to do a

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(Washington, DC: Foreign Policy Institute, Paul H. Nitze School of Advanced International Studies, Johns Hopkins University, 1993), 21.

[331] Maurice Strong, "Stockholm: The Founding of IIED," in *Evidence for Hope: The Search for Sustainable Development*, edited by Nigel Cross (London: Earthscan Publications, 2003), 19-27, here 21.

[332] Steven F. Bernstein, *The Compromise of Liberal Environmentalism* (New York: Columbia University Press, 2001), 42.

think piece on the relevance of the environment issue for developing countries."[333] Strong recalled that Mahbub ul Haq immediately "launched a scathing attack on both the purposes and the agenda of the Conference, articulating brilliantly and caustically the position of developing countries." Mahbub ul Haq's arguments mirrored those first clearly enunciated by Brazil: that environmental problems thus far addressed by the UNCHE were problems for the rich, yet they presented severe economic threats to developing countries. Strong, taken aback by ul Haq's outburst, emphasized his own deep commitment to development. He told the group he had accepted responsibility for planning the UNCHE on his belief that growing environmental concern in industrialized countries might offer a new rationale for bolstering their support of LDCs, because the state of LDC environments was "critical to the health of the entire global environment." Strong knew, however, he did not have enough reliable knowledge and analysis to make that case. Strong invited ul Haq and other participants to partake in a rigorous examination on development and the environment, which had only recently become central to the purpose and prospects of the UNCHE. With Barbara Ward's persuasion and to Strong's relief, Mahbub ul Haq and the others accepted the challenge and planned to meet later that summer with a group of fellow LDC developmental economists and diplomats. And given their new prominence on the issues of development and

[333] Interview of Gamani Corea by Thomas G. Weiss (February1, 2000), *United Nations Intellectual History Project: The Complete Oral History Transcripts from* UN Voices. CD-ROM, 2007.

environment, Strong made sure he invited a Foreign Minister from Brazil to participate.[334]

Courting LDCs

In the meantime, early in 1971, Strong prepared for the second meeting of the UNCHE's twenty-seven nation Preparatory Committee, the first such gathering since the UN General Assembly declared that Conference preparations must include a specific agenda item on the special needs of LDCs. On February 8, 1971, Strong opened the ten-day second session of the Preparatory Committee in Geneva with a speech that emphasized his growing appreciation of LDC concerns. Strong affirmed that although much of the developing world still considered environmental pollution a rich man's problem, such problems were "a disease they would be prepared to risk" if it accompanied the economic growth LDCs urgently desired. Additionally, he noted, LDCs believed the industrial nations who produced most of the world's pollution should assume responsibility for its consequences. Strong explained that, "before jumping enthusiastically on the environmental bandwagon," LDCs wanted greater assurances on safeguarding their development interests and priorities. After all, he said, the global environmental crisis encompassed far more than industrial pollution.[335]

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[334] Maurice Strong, "Stockholm: The Founding of IIED," in *Evidence for Hope: The Search for Sustainable Development*, edited by Nigel Cross (London: Earthscan Publications, 2003), 19-27, here 22.

[335] Annex IV, "Statement by the Secretary General of the United Nations Conference on the Human Environment at the Second Session of the Preparatory Committee, Geneva, February 8, 1971," in United Nations, *Report of the Preparatory Committee for the United Nations Conference on the Human Environment*, *Second Session, Geneva, February 8-19, 1971,* UN General Assembly document A/CONF.48/PC.9 (February 26, 1971), 71-82.

Strong made clear his personal view that the crises facing Spaceship Earth included "the environmental problems of poverty," which were "no less acute and certainly more widespread than the environmental problems of affluence." In fact, he continued, "it is the poor who stand to gain the most from enhancement of their environment; they have fewer resources to waste on costly mistakes or remedial action; and their voice must be fully heard with respect to activities which, even if taken by others, will affect vitally their own interests." In light of his recent meeting with LDC economists, Strong concluded that, "Most importantly, it is coming to be recognized that while improperly planned economic development can have deleterious effects upon the environment, effective environmental planning and action can make a positive contribution to development."[336] Strong made clear his interest in reshaping the UNCHE along LDC interests to ensure their participation.

In accord with the UN General Assembly's recent resolution, Strong's revisions to the UNCHE agenda included introducing a new subject heading of "Development and Environment." Debate under this new subject aimed for special consideration to economic versus social trade-offs among different development alternatives; the economic implications of environmental policies and programs; and the possibility of additional resources for development assistance. As such, the UNCHE would now confront "the impact of environmental action on economic

[336] Annex IV, "Statement by the Secretary General of the United Nations Conference on the Human Environment at the Second Session of the Preparatory Committee, Geneva, February 8, 1971," in United Nations, *Report of the Preparatory Committee for the United Nations Conference on the Human Environment*, *Second Session, Geneva, February 8-19, 1971,* UN General Assembly document A/CONF.48/PC.9 (February 26, 1971), 71-82.

growth, and the impact of growth on the environment."[337] As expected during the preparatory meeting in Geneva, most discussion occurred under this new heading on development.

Conflicts arose over financing the protection of the environment amid economic development and concern over the impact of environmental policies on international trade. Views also diverged between LDCs and some western nations whether the planned Declaration of the conference should include detailed action statements or whether such actions should be part of the global conventions and policies still on the table as a central element of the conference. Strong still hoped for an action-oriented UNCHE, where those actions would represent first steps toward global environmental solutions. Strong explained, "These first steps, even when they are relatively small ones, will be of great importance, as they will establish the pattern for future action." His comments were quite prescient.

To ensure LDC participation, Strong also announced another new component of UNCHE preparations. Before the end of 1971, the UNCHE Secretariat would host four regional seminars—in Bangkok, Addis Ababa, Mexico City, and Beirut—for LDCs to address their concerns and interests separate from the industrialized nations.[338] Strong gambled that the summer meeting he had set with leading LDC economists would produce a report that LDC governments could debate in those regional seminars. Strong wanted LDCs invested in the UNCHE, and his means of accomplishing that goal was reordering UNCHE planning around LDC concerns.

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[337] United Nations, *Report of the Preparatory Committee for the United Nations Conference on the Human Environment*, *Second Session, Geneva, February 8-19, 1971,* UN General Assembly document A/CONF.48/PC.9 (February 26, 1971), 14.

The arguments of Brazil and other LDCs seemed to be making their mark within the UN. However, not all nations confined their environmental visions to the UN.

On February 8, 1971, while Strong opened the second preparatory meeting for the UNCHE, President Nixon announced before Congress the environmental program of the United States for 1971. While Nixon's earlier environmental message in 1970 focused mostly on domestic concerns, his vision for 1971 included a new international agenda shaped in part by the rising chorus of LDC voices against global environmental limits. Nixon sought to quell concerns of any American intents to limit growth, yet his rhetoric remained unclear. Reiterating that the cost of goods should reflect their environmental totalities, Nixon admitted that "adjustments by governments at all levels, by our industrial and business community, and by the public" would require necessary changes and paying the appropriate costs to "prevent problems from reaching the crisis stage." Nixon still sought regulatory actions for environmental protections, yet he encouraged supplementing regulation with market solutions. "Our goal," Nixon declared, "must be to harness the powerful mechanisms of the marketplace, with its automatic incentives and restraints, to encourage improvement in the quality of life." The President of the world's largest economy concluded that the United States and all nations of the world "must better understand how economic factors induce some forms of environmental degradation, and how we can create and change economic incentives to improve rather than

[338] Ibid.

degrade environmental quality."[339] While obviously not abandoning growth, Nixon's comments left the issue of growth open to further debate.

Nixon's desire to move "toward a better world environment" also incorporated recommendations from a State Department report by his Committee on International Environmental Affairs. The report encouraged continued U.S. leadership on the global environment, especially for the UNCHE. But the State Department remained concerned that political conflict on environmental problems revolved around how to transcend national interests against "increasing the power of intergovernmental organizations to act." International organizations, the report concluded, would need to "enforce decisions which subordinate sovereign rights to human rights" in order to protect the global commons. Sovereignty, it seemed, required a reorientation for global environmental protection. To attain this ultimate goal, nations needed to "become accustomed to thinking of the environment as a heritage that can be used more rationally and improved for the welfare of future generations."[340] Toward those ends, Nixon's special message to Congress in 1971 reiterated U.S. commitment to the UNCHE, but it also proposed a new idea for a World Heritage Trust. The World Heritage Trust, as Nixon envisioned it, would preserve ecologically unique landscapes and cultural sites around the world.

[339] Richard M. Nixon, "Special Message to the Congress Proposing the 1971 Environmental Program," February 8, 1971, http://www.presidency.ucsb.edu/ws/index.php?pid=3294, accessed January 12, 2014.

[340] U.S. Department of State, Committee on International Environmental Affairs, Task Force III, "Report on U.S. Priority Interests in the Environmental Activities of International Organizations," December 1970, Folder SCI 41 12/1/70, Box 2890, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD.

While Nixon's proposals regarding the international environment for the coming year of 1971 sought, in part, to mollify LDC concerns about limits to growth, it remained open to suspicion. Despite Brazil and other LDCs' incremental gains over UNCHE planning within the UN, LDCs still harbored concerns that international environmentalism aimed to limit their sovereignty over natural resource use. Nixon's proposed World Heritage Trust did little to assuage their fears. From a perspective grounded in LDC anxiety over regulatory rhetoric on the environment, a World Heritage Trust might be an attempt to use international conservation as a means to restrict the sovereign use of natural resources in the global South. In fact, Brazil later used this very argument to generate suspicion of American actions among fellow LDCs.[341] The LDCs clearly had more work before them to ensure that sustaining economic development became the leading priority in international environmental policymaking.

In 1971, Brazil and other LDCs had plenty of opportunities and new reasons for pushing the priority of development amid environmental planning. LDCs did so during foundational planning sessions for the UNCHE while responding to renewed concerns in the global North about the environmental dangers of economic growth.

[341] Statement by the Representative of Brazil, H.E. Ambassador Miguel Álvaro Ozório de Almeida, on item 47 of the Agenda, United Nations Conference on the Human Environment, Committee II, United Nations General Assembly XXVI, December 2, 1972, Folder 6209, Box 1020, RG 3.1 Rockefeller Brothers Fund Archives, Rockefeller Archive Center, Sleepy Hollow, New York.

Chapter 5

DEVELOPMENT *AND* ENVIRONMENT?
Growth Dynamics and Debating Doom

"I cannot, therefore, regard the stationary state of capital and wealth with the unaffected aversion so generally manifested towards it by political economists of the old school. ... It is only in the backward countries of the world that increased production is still an important object: in those most advanced, what is economically needed is a better distribution … If the earth must lose that great portion of its pleasantness which it owes to things that the unlimited increase of wealth and population would extirpate from it, for the mere purpose of enabling it to support a larger, but not a better or a happier population, I sincerely hope, for the sake of posterity, that they will be content to be stationary, long before necessity compels them to it."
— John Stuart Mill, *Principles of Political Economy* IV, Chapter VI, 1848.

The remainder of 1971 saw major events in defining the long-term implications of the global environmental moment, particularly during final opportunities in the planning process prior to the United Nations Conference on the Human Environment (UNCHE) held in the summer of 1972. Throughout 1971, significant public sectors in the industrialized North continued to call for an environmental revolution that would reorient traditionally destructive practices of economic growth and development. At the same time, however, Brazil and other less developed countries (LDCs) continued to crystallize and publicize their own demands in favor of growth. The LDCs sought not to limit or reconsider growth, but to harness the UN's new international attention on environmental issues as a means to escalate their desires for rapid economic development.

In June 1971, two key occurrences reflected the contingency of what directions Spaceship Earth might move in light of newly realized global

environmental hazards. As part of his effort to enlist LDCs in the UNCHE planning process, Maurice Strong held a small meeting in Founex, Switzerland with economic development experts from mostly poor LDCs. With strong participation by Brazilian Ambassador Miguel Álvaro Ozório de Almeida, the report from this meeting in Founex elucidated the importance of synthesizing development and environment as the primary focus of LDCs. The clear enunciation of these needs and its wide dissemination around the global South allowed other LDCs to embrace the UNCHE as an opportunity to meet their developmental needs in terms of environmental issues.

However, that same June, a systems-based computer model of global dynamics by MIT computer scientist Jay Forrester predicted massive die-off and future human suffering at a global scale unless worldwide limits to economic growth were soon instituted. Just when LDCs began seriously participating in UNCHE planning, the debate that economic growth would lead to global doom found renewed and heightened concern at high levels of domestic and international dialog. In the midst of renewed anxiety on the environmental implications of growth, the United States unilaterally dismantled the existing system for international currency exchanges, which offered for the first time since the end of the Great Depression an opportunity to renegotiate the entire international economic order. Would the upcoming UNCHE provide a forum for reoriented global economics along more ecological lines, despite LDCs' clear prioritization of economic growth? The LDC-influenced report from Founex and the frightening rhetoric of doom by leading scientists and economists who questioned growth offered two very different paths for

how the global environmental moment might proceed both before and during the UNCHE.

This chapter provides detail on the continued debate over development and the dynamics for global growth at their apex, at least in the context of the upcoming UNCHE. The excitement produced over these events in 1971 culminated that winter in an impassioned confrontation between ambassadors of Brazil and the United States in the last UN General Assembly held before the UNCHE that following summer. The dynamics of these debates throughout 1971, and especially in the UN General Assembly, not only circumscribed much of what would and could happen during the actual UNCHE, they formalized an early institutionalization for what evolved eventually, decades later, into the agenda of sustainable development. In terms of international environmental politics, the events in 1971 and early 1972 significantly affected the direction in which Spaceship Earth would sail into the future.

Development and Environment at Founex and Beyond

In early June 1971, one year before the start of the UNCHE the next June, Maurice Strong and Barbara Ward held their scheduled meeting for a small group of international development representatives from LDCs to clarify and debate the issues of development and environment. As the year had progressed, various voices in industrialized nations continued to call for action against the environmental crisis. In the spring of 1971, about a year after America's initial Earth Day, Pope Paul VI delivered in Rome his first public expression on environmental challenges. In it, the

Pope warned against "the technical progress of civilization turning against itself," and he bestowed his Apostolic Blessing to those protecting Earth's "indispensable natural resources." Japanese newspapers continued to report that, despite government action, their national pollution had reached a "grave stage." And in the U.S. Congress, a bipartisan collection of Senators including eight members of the Senate Foreign Relations Committee pushed for creation of global environmental standards. They pushed (unsuccessfully) for passage of Senate Concurrent Resolution 53, which sought a workable agreement at the UNCHE to globally "harmonize the environment quality standards that are necessary to maintain and improve the biosphere."[342] Despite LDC concerns on the issue, much rhetoric in the industrialized world still saw the environment as a crisis requiring drastic revisions to business as usual, especially for international development.

Amid those unresolved tensions over economic growth, environmental protection, and global standards, Maurice Strong gathered some thirty experts to a small motel in the village of Founex, Switzerland, just outside Geneva, where Strong's UNCHE Secretariat had since moved. There, international experts debated the interrelation of development and environment as it affected LDCs. Barbara Ward helped Strong organize the meeting by inviting papers with provocative inputs from the main participants of developmental economists, leading LDC diplomats, and

[342] Airgram from American Embassy, Rome, to Department of State, Washington, "Pope Speaks in Defense of Nature," April 14, 1971, Folder SCI 41 4/1/71, Box 2891, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD; Keikichi Kihara, "Japan's Environmental Pollution at Grave Stage," *Asahi Evening News,* March 16, 1971; "Preparations for and Prospects of the June 1972 U.N. Conference on the Human Environment," Hearings before Committee on Foreign Relations, US Senate, 92nd Congress, Second Session, May 3, 4, 5, 1972 (Washington DC: U.S. Government Printing Office, 1972), 52.

some organizations involved in issues of international trade, like the UNCTAD. Peter Stone, an informational aid in Strong's UNCHE Secretariat, described the Founex meeting as "long on economists but short on ecologists. … It made one realize that Stockholm was going to be a political conference."[343] The planning process getting to Stockholm remained political, too.

Gamani Corea chaired the Founex meeting while Mahbub ul Haq, with Barbara Ward's assistance, oversaw drafting of a final report on their deliberations and conclusions.[344] Miguel Álvaro Ozório de Almeida, a leading voice in Brazil's government's stand on development and environment, also became a central participant at Founex and at ensuing UNCHE planning sessions. Throughout his career, Almeida had counseled Brazil's foreign ministry in various industrialized-world cities, including Hong Kong, Montreal, Washington, and Moscow.[345] He now served as special advisor on scientific and technological matters to Brazil's foreign minister, and he had become Brazil's lead delegate for UNCHE planning. It fell to Almeida to reiterate Brazil's demands for unrestrained development and absolute sovereignty and, in the process, exhibit Brazilian leadership in international affairs. He did not disappoint.

Debates in Founex revolved around the arguments presented earlier by Brazil, but they also moved toward an integration of environment and development. Mahbub ul Haq's report on Founex, titled *Development and Environment*, argued

[343] Peter Stone, *Did We Save the Earth at Stockholm?* (London: Earth Island Ltd., 1973),102.
[344] Maurice Strong, "Stockholm: The Founding of IIED," in *Evidence for Hope: The Search for Sustainable Development*, edited by Nigel Cross (London: Earthscan Publications, 2003), 19-27, here 22.
[345] "Contributors," *International Conciliation* No. 586 (January 1972), 2.

that environmental problems "should not be presented as a pollution problem in the developed world and a poverty problem in the developing countries; instead it should be treated as a problem of the most efficient *synthesis of development and environmental concerns* at different stages of social transitions."[346] The Founex report concluded, just as Brazil initially intoned, "that, in large measure, the kind of environmental problems that are of importance in developing countries are those that can be solved by the process of development itself." Additionally, the experts in Founex agreed to the Brazilian argument that wealthy nations who benefited from industrial growth and also produced most global environmental pollution problems had an obligation to bear the costs of dealing with those problems. This translated into a new need for rich nations to supply new and additional resources to LDCs to better incorporate environmental protections into their development, otherwise known as additionality. The Founex report's demands for financing of LDC development, in addition to funding for environmental protection, thus mirrored Brazil's earlier arguments. The Founex report concluded that,

> Additional aid funds will be required to subsidize research on environmental problems for the developing countries, to compensate for major dislocations in the exports of the developing countries, to cover major increases in the cost of development projects owing to higher environmental standards, and to finance restructuring of investment, production or export patterns necessitated by the environmental concern of developed countries. A suitable mechanism for channeling these funds should be devised.[347]

[346] "Report of the Panel," in *Development and Environment*: *Report and Working Papers of a Panel of Experts Convened by the Secretary-General of the United Nations Conference on the Human Environment, Founex, Switzerland, June 4-12, 1971* (Geneva: United Nations; Paris: École Pratique des Hautes Études, VI Section, 1972), 25, my emphasis.

[347] "Report of the Panel," in *Development and Environment*: *Report and Working Papers of a Panel of Experts Convened by the Secretary-General of the United Nations Conference on the Human Environment, Founex, Switzerland, June 4-12, 1971* (Geneva: United Nations; Paris: École Pratique des Hautes Études, VI Section, 1972), 6, 42.

The immediate publication of the Founex report included a selection of the meeting's most influential working papers, including the provocative statement by Miguel Álvaro Ozório de Almeida. Almeida's arguments were thus distributed around the world, especially for other representatives from LDCS, to help appraise the conflict between environment and development. "In confronting the problem of development and of the protection of the environment," Almeida wrote, "it's thus necessary to obtain, right at the beginning, a series of restrictions." As such, rather than open discussion, Almeida sought to contain it. These restrictions Almeida sought emphasized that environmental concern must not restrict growth nor infringe on a nation's right to develop its sovereign natural resources according to its own domestic needs. Almeida's primary conclusion reprised Brazil's argument that "the main environmental responsibility belongs to the developed countries, and that the main responsibility of undeveloped countries is accelerated economic development."[348] Brazilian diplomacy had managed to make its environmental views required reading for the UNCHE planning process, which thus made them central to the UNCHE itself. Ultimately, Brazil's efforts both before and at Founex, and their spread to other LDCs as a primary part of UNCHE planning, helped enlist more LDCs to attend and participate in Stockholm.

Additionally, historian Steven Macekura concluded correctly that "the Founex report lent credence to the Brazilian cause, claiming that the major problems

[348] Miguel Ozório de Almeida, "Economic Development and the Preservation of Environment," in *Development and Environment: Report and Working Papers of a Panel of Experts Convened by the Secretary-General of the United Nations Conference on the Human Environment, Founex,*

facing developing countries were of a 'different kind' than the ecological issues plaguing the industrialized North. It called for a 'redefinition' of development that would address endemic poverty and environmental degradation."[349] Political scientist Roberto A. Guimarães also noted the striking resemblances between the arguments that emerged in Founex with the positions advocated by Brazil over the prior year. Brazil's government officials, he noted, even boasted about the ways that the Founex Report reflected Brazilian positions. Guimarães concluded narrowly, however, that such similarities reflected how Brazil's concerns were not unique among LDCs.[350] Instead, the near mirroring of Brazilian arguments suggests an undue Brazilian influence over the LDCs and, eventually, over the global environmental agenda.

Maurice Strong described the meeting of experts in Founex as "one of the best that I have ever experienced in terms of spirited intellectual discussion and creative interchange."[351] Instead of dramatizing diametric opposition between development and environment, debates in Founex helped clarify connections between them. Their discussions indicated that environmental concerns included more than industrial pollution and were therefore more relevant to LDC situations than initially appreciated. The general lesson Gamani Corea took from Founex was that environmental issues were "not only caused by the process of development, it is

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Switzerland, June 4-12, 1971 (Geneva and Paris: United Nations and École Pratique des Hautes Études (VI Section), 1972, 109, 118.

[349] Stephen Macekura, "The Limits of Global Community: The Nixon Administration and Global Environmental Politics," *Cold War History* 11:4 (2011): 489-518, here 506.

[350] Roberto P. Guimarães, *The Ecopolitics of Development in the Third World: Politics and Environment in Brazil* (Boulder, CO: Lynne Rienner Publishers, Inc., 1991), 150-151.

also brought up by the lack of development. … Therefore developing countries need to focus on both the environmental aspects of the lack of development and the environmental aspects of getting onto the development path."[352] Instead of relegating environmental protection as a barrier to development, the Founex discussions affirmed it as part of the process. Brazil's Foreign Ministry had helped define a development-centered environmental perspective, and its message quickly spread.

Founex totally changed the tone of UNCHE planning and, ultimately, came to define the UN's early approach to international environmental policymaking. Strong described the Founex meeting as "the single most influential meeting in terms of my development of the [UNCHE] agenda."[353] Realizing the importance of the Founex report, Strong quickly had it translated and widely disseminated to encourage full LDC participation in the UNCHE. He used it as the starting point for his personal diplomacy to excite LDC interest in the UNCHE

For the remainder of the year before the UNCHE, Strong circled the globe nearly nonstop to assuage LDC apprehensions over the UNCHE and secure broad LDC participation. According to Wade Rowland, Strong "traveled hundreds of thousands of miles over every continent except Antarctica in the months preceding the conference. He personally guaranteed scores of African and Asian leaders that

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[351] Maurice Strong, "Stockholm: The Founding of IIED," in *Evidence for Hope: The Search for Sustainable Development*, edited by Nigel Cross (London: Earthscan Publications, 2003), 19-27, here 22.

[352] Interview of Gamani Corea by Thomas G. Weiss (February1, 2000), *United Nations Intellectual History Project: The Complete Oral History Transcripts from* UN Voices. CD-ROM, 2007.

[353] Strong quoted in Steven F. Bernstein, *The Compromise of Liberal Environmentalism* (New York: Columbia University Press, 2001), 42.

their interests would be respected."[354] Strong also dispatched Gamani Corea, chairman of the Founex meeting, to promote its message in several Asian countries, including Singapore, Indonesia, and Malaysia. Corea recalled that as a result of his and Strong's devotion as environmental missionaries and "as a result of the Founex report, the developing countries did come to Stockholm in all their numbers and did get intimately involved in it."[355] Brazilian perspectives remained at the heart of that involvement.

Both in the published Founex report and in separate publications, Brazil's Miguel Álvaro Ozório de Almeida reiterated his point that responsibility for preserving the environment increased with an increased level of development. Therefore, for the sake of saving the global environment, the world's wealthy nations should further finance LDC industrialization. His writings and speeches carried his message throughout later planning sessions for the UNCHE, especially at the regional meetings held that year in underdeveloped locations.[356] In the months following the Founex meeting, four regional seminars held between August and October 1971 addressed UNCHE planning in Bangkok, Addis Ababa, Mexico City, and Beirut. The Founex report, full of Brazil's original arguments, provided a baseline for discussion at each regional meeting, all of which examined the

[354] Wade Rowland, *The Plot to Save the World: The Life and Times of the Stockholm Conference on the Human Environment* (Toronto: Clarke, Irwin, & Co. Ltd., 1973), 47.

[355] Interview of Gamani Corea by Thomas G. Weiss (February1, 2000), *United Nations Intellectual History Project: The Complete Oral History Transcripts from* UN Voices. CD-ROM, 2007.

[356] Miguel Álvaro Ozório de Almeida, "The Confrontation between Problems of Development and Environment," *International Conciliation* No. 586 (January 1972), 37-56.

environmental problems of their respective developing regions in attempt to define action proposals aligned with LDC interests.

For instance, according to the report from the first UNCHE regional planning seminar, which was held in mid-August in Bangkok and co-organized by the Economic Commission for Asia and the Far East (ECAFE), "the seminar shared the fear expressed in the Founex report that interests in the developed countries might use the argument of differences in the costs of environmental regulation for products exported by them as a reason for a new kind of 'neo-protectionism.' … The seminar also shared the fear that excessive preoccupation with environmental problems would lead to a diminution in the flow of resources from developed to developing countries."[357]

The second regional seminar, held the following week in Addis Ababa, reiterated Brazil's arguments in the Founex report regarding additionality. The report of the first all-African seminar on the human environment declared that "Additional funds would be required to subsidize research into the environmental problems of the developing countries to compensate for major dislocation in the proceeds of their exports to cover additional costs of development projects to restore their investment or production patterns."[358] Political scientist Steven F. Bernstein noted that by the time of the third meeting of the twenty-seven-nation UNCHE Preparatory

[357] UN Economic and Social Council, *Report on the Seminar on Development and Environment, Bangkok, Thailand, August 17-23, 1971, organized by the Economic Commission for Asia and the Far East,* UN ECOSOC document E/CN. 11/999 (August 30, 1971), 21-22.

[358] UN Economic and Social Council, *Report of the First All-African Seminar on the Human Environment, Addis Ababa, August 23-28,1971, co-sponsored by the Economic Commission for Africa and the UN Secretariat, Geneva*, UN Economic and Social Council Document E/CN.14/532 (October 11, 1971), 7.

Committee in September 1971, "the influence of Founex and increased public attention had combined to put pressure on the intergovernmental working group to produce a [draft UNCHE] document that represented concrete action."[359] That action, it seemed, would now incorporate development, not limit it.

Brazil's diplomats had reason for satisfaction. As a result of Founex, nearly all LDC ideas about the UNCHE reflected Brazil's view that environmental action must integrate LDC demands for development. But just when it seemed Brazil could rest more comfortably about the upcoming UNCHE, a new collection of arguments for constricting global economic growth on Spaceship Earth exploded across the international scene. As one Brazilian government official recalled, LDCs suddenly faced new worries from a "renewed outburst of the environmentalist campaign, under the direct or indirect inspiration of the so-called Club of Rome."[360] Brazil's battle to make development central to the UNCHE and to future international environmental policy was far from won.

The Global Dynamics of No-Growth Ideas

Although the Founex meeting in June 1971 eventually rallied most LDCs around the Brazilian arguments that environmental action must incorporate developmental assistance, the environmental argument against freezing economic growth was far from buried. The summer of 1971 saw continued international attention to environmental issues. Despite success at Founex, Brazil's foreign

[359] Steven F. Bernstein, *The Compromise of Liberal Environmentalism* (New York: Columbia University Press, 2001), 43.

ministry ensured its international environmental ideology spread widely, both abroad and back at home. On June 11, Brazilian diplomat João Augusto de Araújo Castro delivered a speech in Rio de Janeiro at Brazil's National War College, the Escola Superior de Guerra. Before departing the UN to become Brazil's ambassador to the United States, Araújo Castro warned that developments in the UN seemed set on "freezing of the world power structure."[361]

Araújo Castro told his audience of Brazilians that the Second UN Development Decade of the 1970s seemed destined to fail just like the first. His assumptions stemmed from growing restrictions against LDC desires to, as he phrased it, "transpose into the international field certain principles of social justice and redistribution of wealth." A particular problem with transposing those principles of justice and economic development, Araújo Castro warned, was an exaggerated environmental focus on the "dangers of pollution" and "an unduly strong accent on the dangers of rapid industrialization." Sovereign nations of the UN, he argued, could never agree to environmental limitations when "two-thirds of mankind are far more threatened by hunger and poverty than by the evils of pollution." Instead, Araújo Castro continued, LCDs must "start from the premise that schemes to preserve the human environment ought to take into account the basic factors of development since underdevelopment is, itself, one of the worst forms of pollution."[362]Araújo Castro's speech, later published by Cambridge University's

[360] Roberto P. Guimarães, *The Ecopolitics of Development in the Third World: Politics and Environment in Brazil* (Boulder, CO: Lynne Rienner Publishers, Inc., 1991), 151.

[361] Joao Augusto de Araujo Castro, "The United Nations and the Freezing of the International Power Structure," *International Organization* 26:1 (Winter 1972), 158-166.

[362] Joao Augusto de Araujo Castro, "The United Nations and the Freezing of the International

leading journal on international affairs, might have seemed superfluous given Brazil's simultaneous success in Founex. But such assumptions would be premature.

Also in June 1971, the University of Michigan hosted in Ann Arbor, Michigan a Conference on Asian Environments. The conference brought together for the first time a diverse group of young scholars from countries across Asia—from Israel, India, and Iran, to China, Vietnam, and Japan—all interested in the environmental problems affecting the world's largest continent. Conference panels addressed issues including Asian overpopulation, the environmental implications of international development, and socio-environmental effects from unequal distribution of resources. During conference deliberations some participants, especially American professors, proposed environmental policies for zero-growth. For instance, Rhoads Murphey, the director of the University of Michigan's Center for Chinese Studies, proclaimed the solution to Asia's environmental problems was for Asians "to stop wanting more."[363]

Hamilton S. Amerasinghe, Ceylon's ambassador to the UN and a colleague of Gamani Corea, also attended the Michigan conference as special representative. Like Brazil's Araújo Castro, Ambassador Amerasinghe resented suggestions that environmental concerns meant restraining Asian development and industrialization. He found particularly ridiculous any notions on no-growth. "The governments of developing countries, their economists, and planners," he declared, "must not and will not allow themselves to be distracted from the imperatives of economic

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Power Structure," *International Organization* 26:1 (Winter 1972), 158-166, here 162 and 164.

[363] M. Taghi Farvar, Margaret T. Thomas, Howard Boksenbaum, and Theodore N. Soule, "The Pollution of Asia," *Environment* 13:8 (October 1971), 10-17, here 17.

development and growth by the illusory dream of an atmosphere free from smoke or a landscape innocent of chimney stacks." Most importantly, he concluded, the UN "must not, generally speaking, allow our concern for the environment to develop into a hysteria."[364] However, agitation for restricting growth soon received a major boost.

That same month, in June 1971, MIT computer scientist and systems expert Jay W. Forrester published what he considered an unassuming and rather technical book titled *World Dynamics*.[365] In thick prose and with pages of equations, the book outlined Forrester's computer simulation of world-scale social and economic interactions—the first such planetary computer model of its kind. Forrester's book, with its computer-based predictions, re-ignited the global debate on growth.

Both the book and the debate it kindled provided a peak moment in what was already Forrester's idiosyncratic and multifaceted career as a computer engineer and management scientist. At the end of World War II, while completing a graduate degree in electrical engineering at MIT, Forrester pioneered the construction and programming of digital computers with mathematical models to help solve complex, interrelated problems. In the 1940s and early 1950s, he helped construct the Whirlwind, one of the world's first digital electronic computers at MIT. And amid existential Cold War threats, he helped develop for the U.S. military an early air-defense scheme called the Semi-Automatic Ground Environment (SAGE) system. As mentioned in Chapter 1, by the late 1950s, Forrester began applying his computer programming and systems techniques to model interconnections first for industrial

[364] M. Taghi Farvar, Margaret T. Thomas, Howard Boksenbaum, and Theodore N. Soule, "The Pollution of Asia," *Environment* 13:8 (October 1971), 10-17, here 10.
[365] Jay Wright Forrester, *World Dynamics* (Cambridge, MA: Wright-Allen, 1971).

businesses, which he then scaled up to model entire cities by the late 1960s.[366] Continuing to scale his computer models upward, Forrester's next project had global ambitions. It also connected him to members of the Club of Rome, who harbored deep concerns about the world's environment and the role of economic growth within it.

In June 1970, Carroll Wilson invited Forrester to the Club of Rome's first general meeting at Bern, Switzerland. Carroll Wilson, a scientific advisor to Maurice Strong and an early member of Club of Rome, worked with Jay Forrester at MIT's Sloan School of Management at the intersections of science, technology, and policy. In 1968, when Aurelio Peccei founded the Club of Rome and Forrester was working on modeling city-scale systems, the Club's membership remained small and idiosyncratic. By 1970, the Club's informal and "invisible college" of experts comprised some seventy-five members from twenty-five countries. At the Bern meeting, Peccei and other Club of Rome members listed no less than twenty-six "Continuous Critical Problems" of global, systemic predicaments for humankind. Historically, the Club of Rome is best remembered for producing the *Limits to Growth* report in 1972. But, as argued here, Jay Forrester's association with the Club of Rome and his efforts to address the Club's critical global problems played an essential role in re-igniting the global debate on growth.

[366] Jay Wright Forrester, *World Dynamics* (Cambridge, MA: Wright-Allen, 1971); Jay W. Forrester, "Industrial Dynamics: A Major Breakthrough for Decision Makers," *Harvard Business Review* 36:4 (July-August 1958): 37-66; Jay W. Forrester, *Industrial Dynamics* (Cambridge, MA: MIT Press, 1961); Jay W. Forrester, *Urban Dynamics* (Cambridge, MA: MIT Press, 1969). For more on Forrester's early career, especially his involvement in SAGE, see Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996), Chpt. 3.

The challenges addressed at the Club of Rome's meeting in Bern led Forrester to suggest that his systems dynamics approach, which featured complex series of weighted feedback relationships similar to cybernetics, might model the links within the Club's critical global problems. From his prior studies, Forrester determined that growth in complex systems was a developmental phase, not a constant, and that after growth periods, stable systems evolved and realigned toward a state of equilibrium. Forrester thus proposed the concept of growth as a possible unifying thread throughout the Club of Rome's planetary *problématieque*. Excited by the idea of building a global system, Forrester drafted on his flight back from Bern what became the first computer-based model of planetary socio-economic systems, which he called WORLD1. Over a few weekends of work, Forrester had programmed his draft of WORLD1 into a rough computer simulation.[367]

In July 1970, three weeks after first proposing it, Forrester unveiled his initial world simulation back at MIT during a two-week meeting with the executive committee of the Club of Rome. Forrester's rudimentary WORLD1 computer model divided global systems into five basic subsystems of natural resources, pollution, population, agriculture, and capital investment. To chart the relationships of growth among those variables, his model initially linked those subsystems with some guesswork and cursory data inputs. Establishing a solid system structure and their

[367] Jay W. Forrester, "The Beginning of System Dynamics," July 13, 1989, keynote at the international meeting of the System Dynamics Society, Stuttgart, Germany, http://clexchange.org/ftp/documents/system-dynamics/SD1989-07BeginningofSD.pdf, accessed January 13, 2014; Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (Cambridge, MA: MIT Press, 2010), 366-368; Michael Egan, "Commentary on *The Limits to Growth*," in *The Future of Nature: Documents of Global Change*, edited by Libby Robin, Sverker Sörlin, and Paul Warde (New Haven: Yale University Press, 2013), 114-115.

dynamics mattered more to Forrester than precise data. Forrester's WORLD1 model thus shared structural characteristics from his previous industrial and urban models while also sharing their dynamics of overshoot and collapse. Regardless of any technological fixes to reorder the variables, all of the computer runs in WORLD1 predicted, at some point in the next century, a global-scale collapse. Based on existing trends of increasing pollution, escalating population, and consumption of resources, Forrester's basic model foresaw exponential growth on a finite and closed system like Spaceship Earth as dangerously unsustainable. If global growth continued, it seemed that planetary systems were doomed.[368]

Though it contained only 120 lines of equations and jammed several intricate problems into singular and simple variables, the WORLD1 model made an enormous impact on the Club of Rome leaders, especially Aurelio Peccei. For Peccei, Forrester's model confirmed his fears of global collapse and the hazardous implications of growth. Upon seeing WORLD1, Peccei soon convinced the Volkswagon Foundation to fund an 18-month modeling project that became the Systems Dynamics Group at MIT. The funding initiated the first phase for what the Club of Rome called its Project on the Predicament of Mankind. Over the next several months, Forrester ordered his early computer runs onto consistent time scales and refined WORLD1 into a new model simply called WORLD2. Forrester wrote a technical report based on WORLD2, which he published midway through 1971 as the book *World Dynamics*.

[368] Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (Cambridge, MA: MIT Press, 2010), 368.

Forrester's *World Dynamics* laid the conceptual foundations and lubricated media attention on the potential of global doom from growth on which *Limits to Growth* later capitalized. By the time *Limits to Growth* appeared, Jay Forrester's earlier work had already done much to elevate public attention on computer analyses of global growth. Both studies built off Forrester's systems dynamics models, and both shared similar conclusions: that a variety of economic and social collapse scenarios awaited with savage consequences if humanity's industrial production and consumption of resources continued on their exponential trajectories. Their shared message was that human survival demanded drastic reordering of the global systems for its growing ecological footprint. In short, growth must halt or human civilization would overshoot Earth's carrying capacity. Forrester's global models earned surprisingly wide recognition for its novel computerized approach, its planetary perspective, and the timing of its appearance prior to the UNCHE—the first world conference on the environment.[369]

When Forrester's *World Dynamics* came out in the first week of June 1971—the same month that LDC diplomats and developmental economists met in Founex—Forrester expected little public response, if any. The middle of his technical book contained thirty-four pages of equations; its interesting results appeared as graphs over time that much of the public would not easily understand; it dealt with issues a century into the future, typically outside presumed public interest; and its publisher, with only one prior book, seemed to lack the commercial stature to garner substantial

[369] Michael Egan, "Commentary on *The Limits to Growth*," in *The Future of Nature: Documents of Global Change*, edited by Libby Robin, Sverker Sörlin, and Paul Warde (New Haven: Yale University Press, 2013), 114-115.

reviews of the book. Forrester recalled, "I believed the *World Dynamics* book was for perhaps a hundred people who would like to see how one can organize a mental model into an interesting simulation exercise. That was the worst prediction I have ever made. … The public response was a good hundred fold over what could have been rationally expected."[370] With much of society in the industrialized North predicated on growth, and with a clamoring for growth in the underdeveloped South, the anti-growth arguments in *World Dynamics* became a new touchstone for the debate on ecology and economics.

Within weeks of its release, *World Dynamics*'s message against growth made world headlines. In the last week of June, the book received a front-page review in the *London Observer,* which then circulated around the world. In Europe, *World Dynamics* became the subject of prime time documentary television. Forrester received a request for more information from a New York professor who, while traveling abroad, read about the book in the *Singapore Times*. *World Dynamics* even earned a full-length article in *Playboy*. The book achieved broadest recognition across the United States. That August, the *Christian Science Monitor* devoted a full front page of its second section to the book; in September, *Fortune* magazine gave it a full page and a half, while the *Wall Street Journal* carried columns on Forrester's harsh predictions and warnings against growth. Conservative newspapers across Middle America debated its merits, while the anti-establishment student and

[370] Jay W. Forrester, "Acceptance of System Dynamics Models," March 23, 1995, online post to Ventana Systems UK Forum, http://www.ventanasystems.co.uk/forum/viewtopic.php?f=25&t=146 (accessed January 15, 2014).

countercultural press celebrated its zero-growth environmental message.[371] For a technical book that Forrester expected only a hundred people to read, *World Dynamics* made quite a splash.

In the book and in interviews, Forrester advocated for a viable future by transitioning toward global equilibrium. Forrester readily acknowledged that some of his formulas and computer inputs were educated guesses. Yet, based on his appraisal of existing evidence, he declared that "A society with a high level of industrialization may be nonsustainable … From the long view of a hundred years hence, the present efforts of the underdeveloped countries to industrialize may be unwise." Like austere religious ascetics, Forrester suggested the wisdom and sanctity of LDCs might lie in their poverty. Because of their lack of industry, Forrester explained, poor nations "may be in a better condition for surviving forth-coming worldwide environmental and economic pressures than the advanced countries."[372] The implication was that all humanity, but especially the LDCs, should subsume their growing aspirations for industrial growth for the sake of planetary ecological survival.

Under the title "Economists vs Ecologists," the *New York Times* reprinted a September speech by Hazel Henderson, the director of the U.S. Council on Economic Priorities, delivered to America's National Association of Business

[371] Jay W. Forrester, "The Beginning of System Dynamics," July 13, 1989, keynote at the international meeting of the System Dynamics Society, Stuttgart, Germany, http://clexchange.org/ftp/documents/system-dynamics/SD1989-07BeginningofSD.pdf, accessed January 13, 2014; Jay W. Forrester, "Acceptance of System Dynamics Models," March 23, 1995, online post to Ventana Systems UK Forum, http://www.ventanasystems.co.uk/forum/viewtopic.php?f=25&t=146 (accessed January 15, 2014).

[372] Forrester quoted in David C. Anderson, "Mr. Forrester's Terrible Computer," *Wall Street Journal*, September 28, 1971, 18.

Economists. "From an ecological perspective," Henderson declared, "our economy is grievously distorted." Henderson concluded that classical economic theories of "profit" and "economic expansion" needed total reconsideration, especially in light of "Jay Forrester's planetary models and their gloomy scenarios in *World Dynamics*," as well as the recent work of "economists such as Kenneth Boulding, J. Kenneth Galbraith, [and] Barbara Ward." Together, their work showed in a global perspective that "Industrialization may be a more fundamentally disturbing force in world ecology than population." Instead of discarding environmental invectives for drastic change as unrealistic, Forrester's computer-based scenarios implied the opposite for Henderson: "that businessmen, in fact, aided and abetted by traditional economic theories of unlimited growth, may be the ones whose expectation trajectory has soared out of line with the reality curve of the earth's available resources."[373] Remarkably, national organizations of economists in the world's largest and most dynamic economy were reconsidering the very merits of profit and economic growth. In the global environmental moment, Jay Forrester's computer models had taken a life of their own.

American Shock and LDC Rejoinder

If the media coverage and rhetoric against economic growth were not enough to frighten LDCs about what might occur at the UNCHE, other coinciding events certainly could. On August 15, 1971, without any prior consultation with American allies or even the U.S. State Department, President Nixon decided unilaterally that

[373] Hazel Henderson, "Economists vs Ecologists," *New York Times*, October 24, 1971, F14.

the United States dollar would no longer be convertible to gold. For the first time in the post-World War II era, the U.S. dollar was quite literally no longer "good as gold." Often dubbed the "Nixon Shock," the President's unexpected dismantling of the international system for fixed exchange rates and dollar-to-gold convertibility upended the existing economic system for international trade. In the context of debate over international environmental standards, with the possibility of global conventions to avert ecological damage from industrial pollution, and amid renewed rhetoric about radical shifts to equilibrium economics, Nixon's autocratic decision opened the door to the first opportunity since the end of World War II for a major renegotiation of the international economic order.[374]

From its establishment under American leadership in 1944, the Bretton Woods monetary system—named after the New Hampshire resort where the system was formulated—had secured the international order of fixed monetary exchange in place of the broken gold standard, which was abandoned at the start of the Great Depression. Under the Bretton Woods agreement, the U.S. government agreed to make the American dollar redeemable for gold at a fixed rate of $35 per ounce. The agreement aimed to bolster postwar recovery of international trade and lubricate the flow of international capital by making it easy to convert one currency into another. By pegging its value to gold, the U.S. dollar became the basis for setting the values

[374] Richard Nixon, "Address to the Nation Outlining a New Economic Policy: 'The Challenge of Peace,'" August 15, 1971, http://www.presidency.ucsb.edu/ws/index.php?pid=3115#axzz1UZnES7PMon, accessed January 22, 2014; Lewis E. Lehrman, "The Nixon Shock Heard 'Round the World," *Wall Street Journal*, August 15, 2011; William R. Cline, "Brazil's Emerging International Economic Role," in *Brazil in the Seventies*, edited by Riordan Roett (Washington, DC: American Enterprise Institute for Public Policy Research, 1976), 81.

of all other foreign currencies. The United States agreed to exchange dollars presented by foreign governments for gold at the fixed rate of $35 per ounce, and foreign governments agreed to maintain their currencies in a balanced relationship to the dollar. American dollars, which then flowed freely around the world, thus became the lynchpin of the international currency market and the bedrock of the postwar economic order. The Bretton Woods system successfully sped economic recovery, and thereafter, it facilitated the remarkable expansion of the global economy. But this system for global growth created a new set of challenges for the United States.[375]

Although the United States benefited handsomely as the hegemonic core of the postwar international economy, the recovery and growth of foreign nations' economies contributed to the outflow and accumulation of U.S. dollars abroad, which eventually produced an American balance of payments problem. The foreign accumulation of American dollars resulted from a combination of U.S. overseas investments as well as Cold War commitments to contain communism. Those costly commitments included funding the U.S. military abroad, expenditures for American diplomatic networks, the provision to allies of expensive military hardware and advisors, as well as massive distributions of economic aid, first to rebuild Europe and Japan, then to align Third World nations. In addition, the eventual recovery and

[375] Michael H. Hunt, *The World Transformed: 1945 to the Present* (Boston: Bedford/St. Martin's, 2004); 81-84, 195; Thomas J. McCormick, *America's Half-Century: United States Foreign Policy in the Cold War and After*, Second Edition (Baltimore: The John Hopkins University Press, 1995), 52-53.

growth of foreign economies further contributed to an unfavorable balance of payments for the U.S. economy.[376]

In the past, U.S. exports exceeded its imports to create a U.S. trade surplus; but by 1971, Americans imported more than they sold abroad for the first time since 1883. The commercial trade deficit, which resulted from declining competitiveness of American goods in international markets and the growing allure of foreign products to U.S. consumers, led Washington to print more money. Pegged to gold, the dollar was theoretically the world's stable currency, but it was clearly overvalued. As early as 1958, accumulated foreign holdings of U.S. dollars outweighed American gold reserves, which theoretically challenged the Bretton Woods commitment to exchange dollars for gold at the rate of $35 per ounce. By in the late 1960s and early 1970s, nations like Japan, Switzerland, and France began redeeming tens of millions, and then hundreds of millions of dollars for gold, threatening a run on American gold stocks. Domestically, the United States also faced rising inflation, expanding unemployment, increasing social outlays, and ongoing expenditures in Vietnam. Despite excessive spending, an approaching 1972 election year meant no elected official was willing to raise taxes to fund these outlays. For the United States, the Bretton Woods system had become unsustainable.[377]

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[376] Michael H. Hunt, *The World Transformed: 1945 to the Present* (Boston: Bedford/St. Martin's, 2004), 196-198; Thomas J. McCormick, *America's Half-Century: United States Foreign Policy in the Cold War and After*, Second Edition (Baltimore: The John Hopkins University Press, 1995), 161-165.

[377] David Frum, *How We Got Here: The '70s* (New York: Basic Books, 2000), 295-298; Michael H. Hunt, *The World Transformed: 1945 to the Present* (Boston: Bedford/St. Martin's, 2004), 196-198. See also Francis J. Gavin, *Gold, Dollars, and Power: The Politics of International Monetary Relations, 1958-1971* (Chapel Hill, NC: University of North Carolina Press, 2004); Joanne S. Gowa,

In August 1971, no longer able to sustain the fixed dollar-to-gold price ratio of $35 per ounce, Nixon announced in a nationwide televised address that the United States would unilaterally devalue its dollar and suspend its convertibility to gold. At the same time, Nixon utilized provisions in the Economic Stabilization Act of 1970 to impose a ten percent surcharge on foreign imports while dictating temporary domestic wage and price controls. In Executive Order 11615, Nixon declared "the present balance of payments situation makes it especially urgent to stabilize prices, rents, wages, and salaries."[378] For a quarter century, the dollar's link to gold had established U.S. currency as the primary reference point for international trade and investment. But, in the words of Michael Hunt, "the dollar now 'floated' ingloriously, subject like any other currency to the tides of the market."[379] No one knew how this change would affect foreign currencies or the flow of international trade. But America's abandonment of Bretton Woods and the dollar's collapse did signal that the international economic order was ripe for drastic changes.

Brazil witnessed these changes with a mix of fear and excitement. A potential renegotiation of the global economic order offered Brazil an opportunity to portray itself as an emerging power and possibly secure better trade terms for LDCs. Given Brazil's large size and recent economic dynamism, it considered itself a logical contender for the international economic leadership of LDCs, and thus in a primary

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Closing the Gold Window: Domestic Politics and the End of Bretton Woods (Ithaca, NY: Cornell University Press, 1993).

[378] Richard Nixon, "Executive Order 11615: Providing for Stabilization of Prices, Rents, Wages, and Salaries," August 15, 1971, http://www.presidency.ucsb.edu/ws/?pid=60492, accessed February 4, 2014.

[379] Michael H. Hunt, *The World Transformed: 1945 to the Present* (Boston: Bedford/St. Martin's, 2004), 343.

position to speak on the economic behalf of the global majority. Yet, the unilateral behavior of the United States raised concern that economic decisions of broad significance might proceed without international consultation of that majority.

Furthermore, hegemonic actions like the Nixon Shock induced fear in the context of international environmental anxiety. LDCs like Brazil saw trends across the industrialized North of increasing concern and attention over international environmental challenges, efforts to institute conventions on global environmental standards, calls for the preservation of ecological World Trust sites, and leading scientists with computer models encouraging the end of economic growth. By Presidential fiat, the United States had just stabilized prices and wages. Was this an initial step toward that no-growth, steady-state economic equilibrium?

U.S. Secretary of State William Rogers caught wind of the LDCs' environmental anxieties and acted to contain them. In a letter to Senator Howard Baker Jr., who chaired the Secretary of State's Advisory Committee on the UNCHE, Rogers noted that, "Some of the developing countries have evidenced concern that the forthcoming Stockholm Conference will tend to emphasize environmental improvement at the expense of their economic development." In attempt to "assuage these fears," Rogers sent Senator Baker on an 18-day world tour of developing countries, including stops in Addis Ababa, Nairobi, Bangkok, New Delhi, and Hong Kong. Baker's mission, according to State Department publicity, was to "dispel

notions that environmental legislation would retard economic growth."[380] Many LDCs, especially Brazil, remained skeptical.

To prevent the international economy being reordered along anti-growth environmental lines, Brazil's government redoubled its efforts to ensure that environmental actions for LDCs increased, not decreased development. Brazilian diplomats took their offensive to Mexico City, which hosted the third UNCHE regional seminar for LDCs from September 6-11, 1971. This regional seminar, co-organized by the UNCHE Secretariat and the Economic Commission for Latin America (ECLA), met to address LDC concerns about the UNCHE and, like the prior two regional seminars, used the Founex report for its starting point. Brazil dominated the seminar. According to a British diplomat who observed the meeting, Brazil refused any environmental discussions that "might slow down their unfettered race to join the ranks of the industrial super-league, pollution and all." In what the British observer called "the Brazillian steamroller" that "flattened rather than convinced," the Brazilians worked to "impose their pre-conceived policies on [the seminar's] final product. In this they proved most successful."[381]

The Latin American regional seminar document, unlike the others before it, emphasized development as a right. It also stressed the need to use "all possible means of international financial and technical cooperation to aid the developing

[380] William P. Rogers, U.S. Secretary of State, to Howard H. Baker, Jr., Senator, August 11, 1971, Folder SCI 41 8/1/71, Box 2891, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD; "Senator Baker Studies Environmental Attitudes of Developing Countries," U.S. Department of State *Bulletin*, September 6, 1971, 260.

[381] British diplomat cited in Jacob Darwin Hamblin, "Environmentalism for the Atlantic Alliance: NATO's Experiment with the 'Committee of Modern Society," *Environmental History* 15 (January 2010), 54-75, here 68.

nations, including the Latin American countries," not just for their environmental problems, but for "minimizing the adverse effects that environmental preservation policies of the industrialized nations might have on their development efforts."[382] Led by Brazil, the Latin American LDCs declared brazenly their consideration of environmental policies at the UNCHE would only occur in the context of their escalated economic growth. Maurice Strong's UNCHE Secretariat took note.

At the third meeting of the twenty-seven-nation Preparatory Committee for the UNCHE, held at the UN headquarters in New York, Maurice Strong recognized LDC desires for financial assistance and noted ongoing fears of a conflict between accelerated development and environmental protection. In setting the tone for their planning session, the UNCHE Secretariat declared the following as "basic considerations: concern for the environment should be an integral part of the development process; the limited resources available to developing countries could not be diverted from the urgent needs of development; the quality of life in developing countries was directly dependent on accelerated development; and measures adopted by the developed countries could have adverse consequences on the economies of the developing countries." Due in part to continued Brazilian agitation and to discussions in Founex and at the regional seminars, the LDC majority in the Preparatory Committee further declared, "there should not be any basic contradiction between the goals of development for the developing countries

[382] UN Economic and Social Council, *Report of the Latin American Regional Seminar on Problems of the Human Environment and Development, Mexico City, September 6-11, 1971, co-organized by the UNCHE and the Economic Commission for Latin America (ECLA)*, UN Economic and Social Council document ST/ECLA/CONF. 40/L.5/Rev. 1 (October 28, 1971), paragraph 109.

and environment-oriented actions."[383] The subject of development and environment had been a new addition to the prior Preparatory Committee meeting. By the time of this third meeting, it seemed the UNCHE was less an environmental conference than about development.

The Preparatory Committee made clear its stance against limiting development on account of environmental protection. It recognized a basic difference "between the environmental problems that arose out of the process of development itself, and those related to the state of poverty of many of the developing countries. The basic solution for most of the latter problems could be achieved through an accelerated process of development." Along those lines, the committee declared that, "Concern for the environment must therefore be an integral part of the development process." In direct challenge to anti-growth rhetoric among some Northern environmentalists, the report concluded that, "under conditions prevailing in the developing countries any additional cost involved in improving the quality of the environment could only be envisioned in the context of accelerated growth. Resources cannot be diverted from the urgent needs of development."[384] Brazil not only worked its arguments into the Founex report, its developmental agenda was now ingrained deep into the UNCHE planning process. It ensured that no-growth was a non-starter. But Brazil did not stop there.

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[383] United Nations, *Report of the Secretary-General to the Third Session of the Preparatory Committee for the UN Conference on the Human Environment*, *New York, September 13-24, 1971,* UN General Assembly document A/CONF.48/PC.11 (September 30, 1971), 26-27.

[384] United Nations, *Report of the Secretary-General to the Third Session of the Preparatory Committee for the UN Conference on the Human Environment*, *New York, September 13-24, 1971,* UN General Assembly document A/CONF.48/PC.11 (September 30, 1971), 41.

Later that month, on September 27, 1971, Brazil's Minister of State, Mario Gibson Alves Barboza, again took the honor of opening the debate of the UN General Assembly. At the end of 1971, this twenty-sixth meeting of the UN General Assembly would be the last before the start of the UNCHE that coming June. Barboza directly challenged notions against economic growth with ethical invocations for development. Rich nations, he declared, had a "moral duty and political obligation" to aid "the acceleration of growth of developing countries," or, he continued, "at the very least, not to raise obstacles to their development."[385] In the wake of the Nixon Shock and the end of the convertibility of dollars to gold, Barboza also expressed Brazil's outright panic over a tyrannical reformulation of the international economic policy without consideration of other nations who it affected.

With regard to the prior month's collapse of the Bretton Woods system, Barboza told the General Assembly that Brazil felt "deep concern" over the "new trends and developments that now characterize the international monetary and trade scene." Fear best described the feelings of Brazil's technocratic dictatorship. "I very much fear," Barboza said, "that if Governments and specialized organs adopt measures to reshape the international monetary system without previously consulting the developing countries in the appropriate international organs – I very much fear, I repeat – that the action program for development embodied in the International Development Strategy adopted last year by this Assembly will be gravely impaired

[385] Mario Gibson Alves Barboza, Speech before the XXVI Session of the UN General Assembly, September 27, 1971, in Luiz Felipe de Seixas Correa, ed., *Brazil in the United Nations, 1946-2011* (Brasilia: Fundacio Alexandre de Gusmao, Ministry of External Relations, 2013), 355.

in the very first year of its existence."[386] Brazil's economic planners and policymakers had no intentions of seeing their industrialization progress limited by Northern environmental anxieties or hegemonic economic behavior.

Yet, the next month, as if to further stoke Brazilian fears, Democrats in the U.S. Senate, led by the powerful chairman of the Senate Foreign Relations Committee, J. William Fulbright, succeeded to kill the bill for the entire U.S. foreign aid program. The Senators did so in part out of frustration at the ongoing Vietnam War and resentment over their exclusion by the Nixon administration from the foreign policy process. Before that surprising vote, no U.S. foreign aid bill in the history of the foreign aid program had ever been defeated on the floor of the Senate.[387]

The Senate vote against foreign aid occurred just as Brazil turned to the UN General Assembly to announce its ongoing concerns about U.S. efforts to enact international environmental policy as a means for freezing global economic growth. The Senate eventually voted to approve $1.14 billion for economic and humanitarian aid and $1.5 billion for foreign military support. But even this total was nearly a billion dollars fewer than the original aid request.[388] These circumstances further encouraged Brazilian demands within the UN and among fellow LDCs to combat environmental policies and demand industrialized nations take greater responsibility

[386] Mario Gibson Alves Barboza, Speech before the XXVI Session of the UN General Assembly, September 27, 1971, in Luiz Felipe de Seixas Correa, ed., *Brazil in the United Nations, 1946-2011* (Brasilia: Fundacio Alexandre de Gusmao, Ministry of External Relations, 2013), 360.

[387] Randall Bennett Woods, *J. William Fulbright, Vietnam, and the Search for a Cold War Foreign Policy* (New York: Cambridge University Press, 1998), 254-255; Neil MacNeil, "Foreign Aid: Scrambling to the Rescue; How the Senate Foreign Aid Bill Died," *Time,* Nov. 15, 1971, 13-15; Spencer Rich, "Military Aid Voted in Senate; $1.5 Billion Provided for Revived Bill," *Washington Post*, Nov. 12, 1971.

for escalated LDC development. As debate on the UNCHE continued in the UN, Brazil made clear that environmental issues could not become an excuse for limiting growth and freezing global hierarchies.

Embedding Development in Environment

At the end of 1971, it fell to the UN General Assembly's second committee, which addresses economic and financial issues, to debate a final resolution on the UNCHE before it began in June 1972. Sergio Armando Frazao, Brazil's permanent ambassador to the UN, delivered Brazil's ongoing concerns about environment and development. Frazao first called for unity among LDCs toward the reorganization of the international monetary system, which he then connected to the relationship of development and the environment. "The concept of one earth," he announced, "should be something more than a slogan focused on ecological interdependence: it should also stress that the thesis of global management of earth's resources makes it mandatory for the world economy as a whole to function evenly." Frazao clarified the LDC position for the industrialized nations, explaining that "the pollution of air and water is less disturbing to us than the pollution of poverty and misery." The primary goal for the Second UN Development Decade, he reminded the UN, was not establishing environmental limits but, in language that later evolved with environmental connotations, the UN's focus must be providing the conditions of "sustained development." Bluntly, Frazao then labeled scientific claims about the limits to growth as unsubstantiated:

[388] Ibid.

> Let me make it clear that I do not share the opinion of those who hint that the limitation of the biological capital of the world justifies the argument for a ceiling on global development. In point of fact, with respect to either pollution phenomena or to an alleged curtailment or exhaustion of world resources, nothing really convincing in the present state of scientific knowledge would seem to support the gloomy predictions of those who believe that it is impossible to expand our consumer society in such a manner as to benefit all the peoples of the world.[389]

The UNCHE Secretary General and the U.S. State Department both noted the speech and recognized that Brazil's aggressive anti-environmental stance came from its top policy-makers. Maurice Strong commented that Brazil was "obviously laying their plans carefully and thoroughly, and the shots are being called from the highest levels of their government."[390] Brazil's government sought other governments to their join cause.

In late October, Brazil continued its renewed campaign for LDC unity against environmental encroachments on development. In Lima, Peru, the Ministers of the Group of 77 met to address issues emerging amid the North-South conflict. Their meeting produced the Lima Declaration. Under Brazil's influence, the declaration addressed briefly the potentially negative effects of environmental policies on developing nations. Again, Brazil pressed for sustained development, not environmental limits. Among the concerns listed in the declaration included the express desire that environmental policies should not adversely affect development,

[389] Sergio Armando Frazao's speech reprinted in Airgram from U.S. Mission at United Nations, New York, to Department of State, Washington, "GA Comite II – Development and Environment in Brazil's Statement in General Debate," October 13, 1971, Folder SCI 41 9/1/71, Box 2891, SCIENCE, Subject Numeric Files 1970-73, General Records of the Department of State, Record Group 59, National Archives at College Park, College Park, MD.

[390] Strong made these comments in a letter to Martin Holgate, chief scientist in Britain's new Department of the Environment, as cited in Jacob Darwin Hamblin, "Environmentalism for the

especially the flow and terms of financial assistance. Any new environmental policies must not obstruct LDC efforts "towards the sustained economic development of developing countries." Instead of limiting growth, the declaration stated that, "the environmental policies of the developed countries should facilitate, as far as possible, the development of developing countries."[391] Once again, the rhetoric on development in the new international environmental context represented the seeds of what would become, more than a decade later, the environmental concept of sustainable development.

In late November 1971, back at the UN, the ongoing debate over the role of development in UNCHE planning reached a crescendo. Brazil's Miguel Álvaro Ozório de Almeida spoke for Brazil and escalated his anti-environmental rhetoric. As special advisor on scientific and technological matters to Brazil's foreign minister, Almeida lampooned Northern scientists' warnings on environmental risks. Before the General Assembly, Almeida labeled the scientists fear-mongers who indulged in "para-or-psuedo scientific extrapolation." How else, he asked, could you describe the scientists' sensational warnings? After all, Almeida continued, we are now threatened with science fiction stories about "the melting of polar ice-caps, the consequent increase in sea levels, and the wholesale drowning of some of the largest cities and capitals in the world." Such reckless statements, he complained, had caused the price of real estate to escalate at higher elevations in Rio de Janeiro! He

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Atlantic Alliance: NATO's Experiment with the 'Committee of Modern Society," *Environmental History* 15 (January 2010), 54-75, pg 68.

[391] Ministerial Meeting of the Group of 77*, Declaration and Principles of the Action Programme of Lima, Lima, Peru, November 7, 1971,* UNCTAD document MM/77/11/11 (November 9, 1971),

extended special criticism for the audacity of Northern environmentalists to complain about Brazil's depletion of the Amazon rain forests, which absorbed great amounts of atmospheric CO2 and produced equally significant amounts of the planet's atmospheric oxygen. Almeida stated that it was not Brazil's responsibility to compensate for the North American and European excesses of pollution by limiting Brazilian development of Amazonian resources, or, for that matter, any other parts of its sovereign territory.[392]

But Almeida was just getting warmed up. He chastised the claims of doomsday environmentalists as "terroristic or brain-washing" of the passengers of "our little half-scuttled spaceship." He accused American and other industrialized nations for their Calvinistic sense of self-satisfaction and judgment of others, which implied that wealthy nations had proved their right to salvation and perpetuation, while those who remained in a backward state should be punished for their sins. In an unveiled reference to American scientists like Paul Ehrlich and Barry Commoner, Almeida mocked the "body of ecologists who have been free to escalate their threats and adopt an apocalyptic approach to public opinion." In light of the no-growth rhetoric then popular in the U.S. media, Almeida described American environmental inclinations as "anti-developmental" and accused the UN delegation of the United States of formulating a "grandiose master plan" of legal conventions to impose severe constraints on growth. Unlike American over-dramatizations, Almeida

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circulated to the Third Session of the UN Conference on Trade and Development as Document TD/143 (November 12 1971), 30-31.

[392] Almeida quotations cited in Jacob Darwin Hamblin, "Environmentalism for the Atlantic Alliance: NATO's Experiment with the 'Committee of Modern Society," *Environmental History* 15 (January 2010), 54-75, here 68-69.

boasted that Brazil's approach utilized "a little bit of good old common sense." Almeida hoped other nations, especially the United States, might do the same.[393]

For Daniel Patrick Moynihan—an American academic, public intellectual, and occasional diplomat—Almeida had gone too far. For the past two years, Moynihan had consulted the Nixon administration on international environmental matters, and at the time, he represented the United States in the final UN General Assembly debate on the upcoming UNCHE. Moynihan assured the General Assembly the United States was not "sponsoring an anti-development conference," and it had no intention, implicitly or explicitly, to place a ceiling on LDC development. But, Moynihan also moralized how "neglecting environmental problems can prove to be most costly in the longer run, but the poor developing countries can least afford greater cost." Moynihan next spoke directly to Almeida. The American diplomat berated Brazil for its disrespect of the American delegation and its scientists. Moynihan celebrated the contributions of MIT scientists, naming Carroll Wilson, who, Moynihan said reminded, had contributed to the UNCHE with his reports on the SCEP and SMIC. Finally, Moynihan chastised Brazil for its dangerous delusions about real international environmental challenges. Moynihan even quoted Richard Hofstadter to describe the LDCs' paranoid style. "There are limits to the degree to which such a [paranoid] style should be indulged," Moynihan concluded, "and just as surely there are limits to the good nature with which it will

[393] Almeida quotations from Tim E.J. Campbell, "The Political Meaning of Stockholm: Third World Participation in the Environment Conference Process," *Stanford Journal of International Studies* 8 (Spring 1973), 138-153, here 142; and from Jacob Darwin Hamblin, "Environmentalism for the Atlantic Alliance: NATO's Experiment with the 'Committee of Modern Society," *Environmental History* 15 (January 2010), 54-75, here 68-69.

be endured." Instead of tolerating such paranoia, Moynihan said before sitting down, he hoped the UN General Assembly could proceed with more relevant and mature matters.[394]

Almeida refused to give the Americans the last word and delivered his reply on December 2, 1971. Clearly irked, Almeida spoke for nearly an hour, delivering a twenty-three-page treatise to rally LDCs in support of sustained development. "Part of our task," Almeida made clear, "is exactly to focus the attention of the great developed Powers upon essential aspects of the environment problem and to try to obtain their support for our own priority for the developmental drive in the next decade." While the industrialized nations' intentions for environmental protection may be valid, their Whole-Earth vision remained myopic. The "very serious problem" that rich nations suffered from, Almeida explained, was not seeing "the collateral consequences" of their environmental actions. Such blindness, Almeida claimed, had misguided UNCHE planning. Those misguided actions required "necessary changes," Almeida said, in the direction of development and away from the environmental limits advocated by groups like the Club of Rome.[395]

Since Moynihan had made special mention of MIT scientists, Almeida also felt it necessary to highlight for the UN the apparently intimate "symbiosis" between MIT and the Club of Rome. Almeida explained how MIT's Systems Dynamics

[394] Moynihan quotations cited in Stephen Macekura, "The Limits of Global Community: The Nixon Administration and Global Environmental Politics," *Cold War History* 11:4 (2011): 489-518, here 506.

[395] Statement by the Representative of Brazil, H.E. Ambassador Miguel Álvaro Ozório de Almeida, on item 47 of the Agenda, United Nations Conference on the Human Environment, Committee II, United Nations General Assembly XXVI, December 2, 1972, Folder 6209, Box 1020, RG 3.1 Rockefeller Brothers Fund Archives, Rockefeller Archive Center, Sleepy Hollow, New York.

group, particularly Jay Forrester and Forrester's former graduate student Dennis Meadows, were colluding with the Club of Rome. For its part, Almeida noted, the Club boasted its close contact with "key people in Ottawa, Moscow, Washington, Tokyo, Buenos Aires, Stockholm, Bern, Vienna and other capitals." Members of the Club had even attended the UNCHE third regional seminar in Mexico City, Almeida recalled, where it sought to "monopolize discussions and condemn Brazil." But what, exactly, were the Club and its MIT scientists advocating?[396]

With increasing agitation, Almeida distributed throughout the UN General Assembly a collection of documents prepared, he said, by this "symbiotic group of Romans and MIT researchers." The first documents, he claimed, had been used in high-level meetings with Canadian officials. Quoting at length, Almeida read the Club's own words that, "the overwhelming task for the Club of Rome is to identify and implement that set of policies which will permit us to negotiate an orderly transition to equilibrium." Quoting from another document, this one published by Club founder Aurelio Peccei, Almeida highlighted the Club's stated proposition "to negotiate a deliberate transition from world-wide growth to global dynamic equilibrium." For Almeida, it was too much. "How can this desideratum be simultaneous with the U.N. Second Decade?," Almeida exclaimed. "Why are [the Club of Rome's] members being seen as very active [and] specially invited guests at international meetings? Why is public opinion being flooded with their side of the

[396] Ibid.

truth on environment? Why are their works and members being frequently seen in National Academies of Sciences?"[397]

Almeida accused the Club and Moynihan's MIT scientists of seeking to implement the international control over resource use, but even worse, he saw indications for similar control in the UNCHE planning documents. First, the American government, on the directives of President Nixon, continued promoting the creation of a World Heritage Trust to supposedly "save for future generations the most outstanding natural areas." Was it a coincidence, Almeida wondered, that under the heading of "The Planning of Natural Resources," that UNCHE planning documents indicated "the need for a world inventory of natural environmental resources," and that such information was listed as "essential for *control at the international level*?" This was not paranoia, Almeida retorted to Moynihan. Brazil simply felt forced to fight what Almeida called "the apocalyptic approach that has colored Stockholm so strongly from the first days." Brazil's efforts, he continued, were aimed "at what seemed us to be a mounting pressure to impose on the world community legally binding instruments which might suit the interests of a few, but which in fact marginalize developmental and other priorities of the developing countries." The environmental moment, Almeida declared, would not be an excuse for neocolonial control of LDC growth. If there was to be a revolution, Brazil ensured it would be developmental, not environmental.

As part of his efforts to ensure that legally binding instruments would not occur at the UNCHE, Almeida then introduced to the UN General Assembly a

[397] Ibid.

resolution titled "Development and Environment," already sponsored by thirty-three other nations. Almeida described the resolution as a "preventative action." It indicated, he said, "the only possible perspective in which the developing countries are prepared to accept the exercise to be undertaken at Stockholm."[398] For Brazil and its LDC supporters, the resolution codified their starting point for international environmental policymaking—a point from which future negotiations from then to now have yet to move beyond.

The "Development and Environment" resolution reiterated ideas Almeida and other Brazilian foreign ministers had championed since the recent environmental revolution dawned in industrialized nations. The resolution re-defined what once might have been possible at the UNCHE. In particular, it addressed the potential of legally binding international instruments at the UNCHE by ensuring that "minimal standards of preservation of the environment" could only be defined and controlled at the national level. And it prescribed the conference's ability to enact any environmental policies that might threaten national sovereignty over natural resources. It laid clear blame on wealthy nations for causing environmental problems with their "improperly planned and inadequately coordinated industrial activities," and it determined "therefore the main responsibility for the financing of corrective measures falls upon those countries." As for LDCs, their priorities remained "integrated and rational" industrial growth, not the unplanned, polluting activities of the North. "Such [rational] development," the resolution explained, "represents at the present stage the best possible solution for most environmental problems in the

[398] Ibid.

developing countries."[399] Development, for LDCs, offered the solution to any possible problem, apparently even problems that some styles of development caused.

The resolution also reiterated Brazil's continued call for additionality, noting the "need for developed countries to provide additional technical assistance and financing," beyond the Second UN Development Decade targets, "and without affecting adversely their programs of assistance in other spheres." Toward those ends, the resolution requested Secretary-General Strong prepare a scheme for a special fund of voluntary contributions to provide the additional funding for LDCs. Finally, it stressed that the UNCHE Declaration and Action Plan "must … recognize that no environmental policy should adversely affect the present or future development possibilities of the developing countries."[400] In short, the resolution ensured that the UN General Assembly would not accept any environmental policies that did not focus primarily on the predominance of economic development.

Within weeks, before the end of December 1971, the "Development and Environment" proposal became official Resolution 2849 of the twenty-sixth UN General Assembly—its definitive statement before the UNCHE occurred, setting both the tone and boundaries of the conference. During voting in the General Assembly, the resolution found support from an overwhelming majority of eighty-five LDCs. While several industrialized nations abstained, only two voted against it: the United States and the United Kingdom. Despite widespread public concern in the industrialized North about humanity's survival aboard Spaceship Earth and dire

[399] UN General Assembly resolution 2849 (XXVI) "Development and Environment," December 20, 1971.
[400] Ibid.

predictions of environmental catastrophe from growing populations and polluting industrial technologies, Brazil ensured that, within the United Nations, development would become forever inseparable from the environment. Here, as a result of Brazil's continued advocacy, lay the roots of an institutionalized policy for the UN's future agenda of sustainable development. At the end of 1971, however, Brazil and its LDC allies ensured that the international focus remained not on sustainable but on *sustained* development.

The UNCHE's contested path toward Stockholm ran through Founex and the UN resolution on "Development and Environment," and once through, the conference carried those burdens into its final planning sessions. Given Maurice Strong's format where "the process is the policy," that meant the determinations of those planning documents would be embedded as the heart of the UNCHE itself. LDC dominance of the UNCHE planning process continued in the months leading up to the actual conference in Stockholm. Brazil and other LDCs, especially those from Africa, maintained their rhetoric against environmental restraints to development, particularly in the face of growing popular unrest about the ecological limits of industrial growth.

Doom Still Ahead, but Development Still Enshrined

At the start of 1972, with the UNCHE scheduled to begin that summer, debates over the role of growth in planetary survival were further enflamed by the worldwide popularity of two "doomsday" publications: *The Ecologist* magazine's *A Blueprint for Survival*, and the official release of another Club of Rome report titled,

Limits to Growth. The Club of Rome and Jay Forrester's *World Dynamics* inspired *A Blueprint for Survival*, which was published by Edward Goldsmith and his British editors of *The Ecologist* magazine in January 1972. Its opening sentence declared, "The principle defect of the industrial way of life is that it is not sustainable." It claimed that "termination" of industrial development and growth, within the next eighty to one hundred years, was "inevitable" if human survival should continue. In addition to persuading "governments, industrial leaders, and trade unions throughout the world to face these facts and to take appropriate action while there is still time," the authors of *Blueprint* hoped to inspire "national movements to act at national levels, and if need be to assume political status and contest elections." Its radical proposals to create a "society that is sustainable" included global freezing of industrial growth, voluntary stabilization of population growth, and decentralized social and economic practices.[401]

A Blueprint for Survival quickly generated heated debate. Thirty-three prominent scientists endorsed the report, including longtime environmentalist Sir Julian Huxley. Coverage in *The Times* of London returned another letter of general support from 187 other scientists, while the *New York Times* write-up on *Blueprint* stirred a spate of favorable letters to the editor. Yet, in a long editorial in the influential British science journal *Nature*, editor John Maddox chastised both the *Blueprint* and its scientist supporters, who he scolded "should have known better."[402] Sick of apocalyptic environmentalism, Maddox eventually produced a book-length

[401] Edward Goldsmith and editors of *The Ecologist*, *A Blueprint for Survival* (Boston: Houghton Mifflin, 1972), 3, vi.

critique against what he titled *The Doomsday Syndrome*. In addition to deriding much of the science behind apocalyptic environmental visions, Maddox argued that overblown fear mongering would ultimately backlash against the environmental movement.[403] Perhaps intrigued by such critiques, the popularity of *Blueprint* in the January 1972 edition of *The Ecologist* inspired "teach-ins for survival" at British campuses, featuring debates with British MPs. After selling 100,000 copies in a few months, it was quickly published as a book, both in Europe and the United States, with an introduction to the U.S. edition by Paul Ehrlich.[404] That spring, mass media attention to the challenges of growth escalated further with publication of the Club of Rome's *Limits to Growth* report, which MIT's Systems Dynamics group based directly on Jay Forrester's earlier work in *World Dynamics.*

After completing work on WORLD2 and publishing *World Dynamics*, Forrester moved on to other projects, although he continued as a consultant to the Systems Dynamics Group at MIT. Two of Forrester's former students, Dennis and Donella Meadows, who had recently married, led that group at MIT and added layers of complexity to Forrester's original models. Throughout 1971 and early 1972, Dennis and Donella Meadows's team further refined and produced another global computer simulation called WORLD3.[405] As part of the Club of Rome's Project on

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[402] Media coverage cited in "Ecology, Survival, and Society," *Science News* 101:7 (February 12, 1972), 100-101.

[403] John Maddox, *The Doomsday Syndrome* (New York: McGraw-Hill, 1972.

[404] Michael Schwaub, ed., *Teach-In for Survival* (London: Robinson and Watkins Books, 1972), for the record of the Teach-In on *A Blueprint for Survival* at Imperial College, London, in May 1972.

[405] Jay W. Forrester, "The Beginning of System Dynamics," July 13, 1989, keynote at the international meeting of the System Dynamics Society, Stuttgart, Germany, http://clexchange.org/ftp/documents/system-dynamics/SD1989-07BeginningofSD.pdf, accessed January 13, 2014; Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (Cambridge, MA: MIT Press, 2010), 366-368; Michael Egan,

the Predicament of Mankind, Donella Meadows drafted their findings and eventually, in March 1972, published it for general readership as *The Limits to Growth*.[406]

In March 1972, at the Smithsonian Institution in Washington, D.C., the Club of Rome unveiled to massive media fan-fare its *Limits to Growth* report, which summarized for a popular audience the ideas in *World Dynamics*.[407] The distinguished invited audience at the Smithsonian included U.S. senators and representatives, ambassadors, business leaders, heads of government agencies, and fleets of reporters who further spread the Club of Rome's message. Like Forrester's technical book, the computer-aided analyses of interdependent global systems in *The Limits to Growth* warned that continued trends for exponential economic, industrial, and human population growth would inevitably produce catastrophic global die-off and worldwide environmental disruption.

The official release of *The Limits to Growth* stirred a hornet's nest of new agitation about economic growth. While some economists earlier embraced Forrester's similar claims, because of its wider appeal, *The Limits to Growth* immediately garnered pungent critiques from economists and other social scientists. Swedish economist Gunnar Myrdal declared, "I think it is nonsense to talk in global terms about limits to growth with American use thirty times as much of the natural

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"Commentary on *The Limits to Growth*," in *The Future of Nature: Documents of Global Change*, edited by Libby Robin, Sverker Sörlin, and Paul Warde (New Haven: Yale University Press, 2013), 113-116.

[406] Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, William W. Behrens III, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Universe Books, 1972).

resources as poor countries. We must look at redistribution." The economics editor of the London *Times* lambasted the advocated against growth as "schoolboy howlers of logic and fact cloaked in portentous, but specious, computerized models."[408] Nonetheless, *The Limits to Growth* appeared in thirty languages, sold four million copies, and became an international best seller with extensive media coverage. *Time* magazine's asked of the report, "Is the Worst Yet to Be?" While the *Washington Post* warned that *The Limits to Growth* report "has already made the coming planetary conference on the human environment in Stockholm look hopelessly old fashioned."[409] Though both the *Limits* and *Blueprint* publications came from mostly Northern and Western supporters, each had global intentions with significant audiences of influence, and both directed their messages toward the upcoming UNCHE.

Despite international debates about economic growth amid the global environmental crisis becoming increasingly mainstream, Brazilian and LDC-influence over the UNCHE planning process ensured that the UN would not be the forum for hosting such debates. American intelligence reports revealed the on-going

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[407] Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, William W. Behrens III, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Universe Books, 1972).

[408] "Gunnar Myrdal Comments on: America's Image, Black Rebellion, Limits to Growth, and Population Control; An Interview," *Bulletin of the Atomic Scientists*, November 1972, 5-7, here 7; Peter Jay, "Flaws in Ecodoomsters' Arguments, *The Times* (London), May 31, 1972, 14. See also William D. Nordhaus, "World Dynamics: Measurement without Data," *The Economics Journal* 83:332 (1972), 1156-1183; H.S.D Cole, Christopher Freeman, Marie Jahoda, and K.L.R. Pavitt, *Models of Doom: A Critique of The Limits to Growth* (New York: Universe Books, 1973).

[409] "Environment: The Worst Is Yet to Be?" *Time,* January 24, 1972; Claire Sterling, "Club of Rome Tackles the Planet's 'Problematique,'" *Washington Post*, March 2, 1972, A18; Claire Sterling, "A Computer Study of Earth's Interacting Forces," *Washington Post*, March 6, 1972, A20. See also, "Can the World Survive Economic Growth?" *Time,* August 14, 1972, 56-57; Ramchandra Guha, *Environmentalism: A Global History* (New York: Longman, 2000), 75, 78; John McCormick, *The Global Environmental Movement* (West Sussex, UK: John Wiley & Sons, 1995), 90-96.

challenge from Brazil and other LDCs. The same week the Smithsonian hosted the coming-out party for *Limits*, a U.S. intelligence report described Brazil's beliefs about environmental issues, titled "Brazil: If Development Brings Pollution, So Be It." It told U.S. policy-makers how "Brazil's official policy, reflected in preliminary discussions, places developmental goals above pollution control and seeks to force the developed countries to assume responsibility for controlling pollution." And it confirmed that "those who make policy, such as President Medici, the Foreign Office, and powerful Minister of Finance Delfim Netto, are in close agreement and claim international standards will be used to keep the developing nations dependent."[410] That issue of international standards and the passage of conventions in Stockholm remained the final challenge for Brazil to knock down. It sought to do so at the UNCHE's fourth and final meeting of the twenty-seven-nation Preparatory Committee, scheduled from March 6-10, 1972, in New York.

A Soviet Surprise and Final Pre-UNCHE Preparations

Between December 1971 and the Preparatory Committee meeting in March 1972, Strong and his Secretariat again traveled the globe for private meetings with various governments to settle differences that might impede their conference participation or stymie completion of remaining business for the fourth and final Preparatory Committee meeting. One difference left unresolved, however, was the exclusion of East Germany from the UNCHE, which prompted the withdrawal of the

[410] Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 317: Intelligence Note RARN-7 Prepared by the Bureau of Intelligence and Research, Washington, March 2, 1972: Brazil - If Development Brings Pollution, So Be It.

Soviet Union and most of its Eastern-European allies from the UNCHE. The Soviets were protesting the UN General Assembly decision in December 1971 to uphold the Vienna formula, which would limit attendance at Stockholm to only those nations that were either members of the UN or to one or more of its specialized agencies.[411] Such restrictions for participating at UN events were traditional protocols at the UN, nearly as old as the UN itself. However, the proposal of this General Assembly motion by Great Britain and the United States added to its distinct Cold War drama. With regard to Germany, it meant that West Germany, as a member of UNESCO and the World Health Organization, could attend the Stockholm Conference. However, East Germany, which was not a member of any UN organization, could not attend.[412] Strong's negotiations to find a compromise failed to produce any result.

The growth of LDC concerns regarding development and environment had put the Soviet Union in a bind. If the Soviets continued to move forward in promotion of international environmentalism, as it had done in conference preparations up to this point and as part of the processes of détente with the United States, than LDCs might perceive the Soviet Union as another imperialistic Northern power seeking to impose economic restrictions on LDCs in the name of the environment. The Soviet Union was, after all, quite industrialized with self-identified roots in the Western world. In an effort to untangle itself from such dilemmas, the Soviets relied on the not-quite dead horse of the status of East Germany to announce

[411] UN General Assembly resolution 2850 (XXVI) "United Nations Conference on the Human Environment," December 20, 1971, operative paragraphs three and four.

its withdrawal from final Preparatory Committee meeting in March. The USSR also declared its intention to boycott the UNCHE altogether.[413] The Soviet Union would deny the Stockholm Conference the important presence of European communist nations in order to protect its socialist credibility and ensure a positive image among Third World nations.

West and East Germany's ongoing *Ostpolitik* provide an ironic background to this dilemma for the UNCHE. Essentially, *Ostpolitik* enabled détente between western and eastern Europe. *Ostpolitik,* conceived and lead by West German chancellor Willy Brant, signified the normalization of relations and the careful control of people, goods, and ideas between West Germany and the eastern bloc, including East Germany.[414]In the months preceding the UNCHE, negotiations ensued to secure a solution to East Germany's hopeful participation at Stockholm, and thereby allow the Soviets and other eastern bloc nations to also attend. However, Brant felt pressure to keep East Germany out of the UNCHE in order to appease West German's anti-Soviet hardliners. Those hardliners threatened Brant's control of a fragile West German government coalition of social democratic-liberals, which Brant needed to secure his *Ostpolitik* policies.[415]

In May 1972, after years of difficult negotiations, Brant narrowly survived a vote of confidence and squeezed the approval of opening relations with East

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[412] Wade Rowland, *The Plot to Save the World: The Life and Times of the Stockholm Conference on the Human Environment* (Toronto: Clarke, Irwin, & Co. Ltd., 1973), 39.
[413] Ibid.
[414] Raymond L. Garthoff, *Détente and Confrontation: American-Soviet Relations from Nixon to Reagan*, Revised Edition (Washington, DC: Brookings Institution, 1994), 125-141; John Lewis Gaddis, *The Cold War: A New History* (New York: Penguin Press, 2005), 154.

Germany through the West German parliament. Brant's success had the short term impact of keeping East Germany, and therefore the rest of the Soviet bloc including the USSR, away from Stockholm; yet, it helped Brant move closer to achieving his long-term goal of eventually opening relations with East Germany after thirty years of isolation and tension. Ironically, on June 4, 1972, the same week the UNCHE opened in Stockholm, newscasts announced the signing of a British-French-American-Soviet accord to officially normalize *Ostpolitik*, which later resulted in the Basic Treaty between East and West Germany in December 1972, as well as the SALT II nuclear arms control agreement signed earlier in May 1972, just before the UNCHE. The Basic Treaty in Germany finally paved the way for East Germany's eventual entry into the UN simultaneously with West Germany. In the end, Poland arrived at the Stockholm Conference, yet the Soviet Union, Bulgaria, Hungary, and Czechoslovakia, and, of course, East Germany did not.[416] The absence of the Soviet Union and other Eastern European communist nations from the final UNCHE planning session and the actual conference lent further drama and awareness of the new state of international politics. If it had not already, the UNCHE exemplified a shift in global conflict from its recent East-West axis to a clear North-South confrontation.

Despite the Soviets' self-removal from the UNCHE planning process, the fourth and final UNCHE Preparatory Committee in New York proceeded. Having secured the resolution on "Development and Environment," which ensured an overt

[415] Kai Hünemörder, "Environmental Crisis and Soft Politics: Détente and the Global Environment, 1968-1975," in *Environmental Histories of the Cold War* (New York: Cambridge University Press, 2010), 257-276. See also Rowland, *The Plot to Save the World*, 40.

focus on LDC growth, the Preparatory Committee noted with satisfaction the "ever-increasing involvement of developing countries in the Conference process."[417] Two of the key remaining issues for the March meeting included the status of Draft Declaration on the Human Environment and the possibility of submitting five conventions that Strong hoped to have ready for signature in Stockholm as a reflection of its orientation toward action. The proposed conventions included control over the export, import, and transit of endangered species; the conservation of wetland of international importance; the conservation of certain island for science; the conservation of world heritage; and an ocean dumping convention.

However, according to an observer who attended the fourth meeting on behalf of the World Bank, "Brazil again questioned the wisdom of and propriety of hastening to prepare conventions for signature at Stockholm."[418] The report from the meeting noted that, along with Brazil, several LDCs "felt that the adoption of conventions by the Conference was not essential to its success and indeed might endanger the consensus which it was hoped to achieve on all the substantive issues before the Conference."[419] Since none of the draft conventions expected to be ready by the UNCHE in June, rather than rush their delicate crafting, Brazil and other

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[416] Ibid.

[417] United Nations, *Report of the Preparatory on its Fourth Session*, *New York, March 6-10, 1972,* UN General Assembly document A/CONF.48/PC/17 (March 15, 1972), 10.

[418] Tim E.J. Campbell, "The Political Meaning of Stockholm: Third World Participation in the Environment Conference Process," *Stanford Journal of International Studies* 8 (Spring 1973), 138-153, here 143.

[419] United Nations, *Report of the Preparatory Committee on its Fourth Session*, *New York, March 6-10, 1972,* UN General Assembly document A/CONF.48/PC/17 (March 15, 1972), 6.

LDCs successfully deflected their introduction to the UNCHE. Global environmental conventions simply would not appear in Stockholm.[420]

With that, only the draft of the Declaration on the Human Environment remained for debate at the final Preparatory Committee gathering. Early drafts of the UNCHE Declaration spurred the *Washington Post*'s disappointing report that Stockholm would see "no sacrifice of sovereignty, no worldwide codes or injunctions … in a word, no commitments." Instead, it anticipated correctly that "the Stockholm Conference will be largely hortatory." Maurice Strong had hoped the Declaration would become an inspirational document akin to the Declaration of Human Rights, but in subcommittee debates, lofty rhetoric on global environmental aspirations created little consensus. Instead, the Declaration reflected what the *Washington Post* described as "the deadening compromises made to satisfy some 130 widely disparate governments."[421]

At the final Preparatory Committee meeting, the working group on the Draft Declaration debated more than sixteen versions of revisions. Brazil again led a contingent of LDCs, including Costa Rica, Egypt, Yugoslavia, and Zambia to demand that meeting the environmental responsibilities of the global community required meeting its economic consequences with additional financial assistance. Toward that end, and in effort to display its leadership in international environmental

[420] Some of the intended conventions were approved later, including the Ocean Dumping Convention, signed by more than thirty governments in December 1972, and the Convention on International Trade in Endangered Species in 1973. For more on the convention on ocean dumping, see Jacob Darwin Hamblin, "Gods and Devils in the Details: Marine Pollution, Radioactive Waste, and an Environmental Regime circa 1972," *Diplomatic History* 32:4 (September 2008), 539-560.

[421] Claire Sterling, "Likely and Unlikely Items for the Stockholm Agenda: First Planetary Conference on the Human Environment," *Washington Post*, February 6, 1972, B6.

affairs, particularly with the absence of the Soviets, the U.S. delegation submitted a separate draft resolution for a voluntary fund creating specifically for environmental aid. It proposed a five-year target of $100 million, of which the United States would contribute $40 million on a matching basis. While far below the target recommended by the Secretariat, the funding resolution moved to the UNCHE for final passage.

Eventually, the Preparatory Committee agreed upon a delicate draft preamble and several principles for its draft declaration. Many of Brazil's theses on the international environment permeated both the UNCHE's Draft Declaration and its proposed Action Plan of recommendations. Yet total agreement on the Declaration remained very fragile. Few nations liked the Draft Declaration but in hopes of making the UNCHE a symbolic success in terms of global cooperation, the draft moved to the UNCHE for its hopeful approval there.[422] According to a retrospective by the International Institute for Environment and Development, published ten years after the UNCHE, Brazil's triumph in securing development as the essential component for the conference meant that "developing countries joined the Stockholm conference in 1972 with their suspicions allayed but not removed." Allaying LDC concerns enabled their participation in the UNCHE planning and their attendance in Stockholm; but, the fact that their concerns were not removed meant that many of Stockholm's recommendations became watered down compromises.[423]

[422] Tim E.J. Campbell, "The Political Meaning of Stockholm: Third World Participation in the Environment Conference Process," *Stanford Journal of International Studies* 8 (Spring 1973), 138-153, here 143-144; Stephen Hopgood, *American Foreign Environmental Policy and the Power of the State* (Oxford: Oxford University Press, 1998), 82-84.

[423] Robin Clarke and Lloyd Timberlake, *Stockholm Plus Ten: Promises, Promises? The Decade since the 1972 UN Environment Conference* (London: International Institute for Environment and Development and Russell Press Ltd, 1982), 7.

In March and April, Maurice Strong released to the general public the Draft Declaration and the Action Plan for the Human Environment, with its vague assortment of recommendations for nations to agree upon and enact after meeting in Stockholm. Neither document offered requirements for formal commitments, and the hundred-plus Action Plan recommendations rambled over a disparate array of issues, from atmospheric pollution to technology transfer to the environmental impact on trade relations. The recommendations focused mostly on environmental assessment and national management, without clear guidance for resolving the social or economic roots of the global environmental crisis. That these or any recommendations emerged from the tense UNCHE preparatory process was a feat in itself, even they lacked clarity and concrete direction.

In making public the details of the UNCHE's two-year planning process, Strong made the best of the preparatory dialogs by promoting further attention to the UNCHE itself. He declared that, through the UNCHE planning, environmental issues had finally come to be seen globally as some of "the most pervasive, profound, and revolutionary issues that man has ever faced." The ongoing environmental crisis, he continued, "requires us to confront such fundamental issues as the possible limitations to growth, the purposes of growth, the control of technology, the utilization of the world's resources and distribution of its opportunities."[424] His words seemed tailored to nations in the North, who had first called for this world conference.

[424] "Global Environmental Action Plan Proposed for Stockholm Conference: Reports and Action Recommendations Culminating Two-Year Effort Made Public at UN Headquarters," UN Press

Not wanting to scare LDCs with his reference on the limits to growth, Strong also emphasized the "special importance" and "the compelling new imperative" that international environmental concerns provide to "the priority task of accelerating the development of the majority of mankind whose principle environmental concerns derive from their very poverty and underdevelopment." Nonetheless, the UN Press Release called for nations to embrace a "significant redirection of its industrial and scientific capabilities" and that the "ultimate goal must be to achieve a dynamic equilibrium between man and the natural environment."[425] This rhetoric, which combined equilibrium and limits with appeals for accelerating development, came off as Orwellian double-speak, even as it sought to appease and popularize the UNCHE in both the industrialized North and in the LDCs. The global environmental moment produced the rhetoric on which efforts to synthesize global growth with global environmental protection proceeded. Yet, the moment also saw weak institutionalization of actions to accomplish such a synthesis.

Even if the UNCHE planning process had completed its final work before the conference commenced in June 1972, debate and concern over the conflicting issues of development and environment continued around the world. In the weeks leading up to the UNCHE, the growing popularity of ideas for limiting industrial growth amid environmental crisis inspired African nations to voice their continued suspicions. At a meeting in Dakar in April 1972, experts with the Organization for

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Release HE/ 102, April 21, 1972, in Folder 6210, Box 1021, RG 3.1 Rockefeller Brothers Fund Archives, Rockefeller Archive Center, Sleepy Hollow, New York.

[425] "Global Environmental Action Plan Proposed for Stockholm Conference: Reports and Action Recommendations Culminating Two-Year Effort Made Public at UN Headquarters," UN Press

African Unity (OAU) produced a statement declaring that the UNCHE documents still did not give enough serious attention to the needs and preoccupations of the LDCs. They explicitly rejected the "false dilemma" of a choice between "no growth" as suggested in the Club of Rome, or "ruinous continuation of the present exploitation of natural resources." The OAU experts even moved beyond Brazil's calls for additionality to assert the "right to reparations" for prior colonial exploitation as well as present exploitation of African resources by foreign powers. At the same time, the experts at Dakar recognized the environmental need to alter traditional methods of development. To avoid the prior ruinous exploitation of African resources, the experts insisted on "reappraising all methods and models imposed from abroad." The Dakar group saw no conflict between development and environment, provided development fell "within the framework of a model specifically designed to serve the interests of Africa's population." In light of the African statement, the *Washington Post* reported that, "the world's rich and poor countries are evidently going to be hopelessly at odds in Stockholm. … [T]he poor ones especially seem more suspicious and mutinous than ever."[426]

Brazil, having successfully incorporated its arguments on development as a central component in the documents that emerged from the UNCHE planning machinery, and having inspired other LDCs in Africa and elsewhere on the

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Release HE/ 102, April 21, 1972, in Folder 6210, Box 1021, RG 3.1 Rockefeller Brothers Fund Archives, Rockefeller Archive Center, Sleepy Hollow, New York.

[426] Dakar group statement quoted in both Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 322: Intelligence Note REC -11 Prepared by the Bureau of Intelligence and Research, Washington, May 31, 1972: Stockholm Environment Conference – African Position; Claire Sterling, "Rich and Poor Nations Collide: World Politics and Pollution Control," *Washington Post*, May 26, 1972, A24.

importance of their arguments, next spread their message beyond the UN. That spring, Brazil's recently appointed ambassador to the United States, João Augusto de Araújo Castro, worked to insert the priority of development into the academic global environmental discourse. For Araújo Castro, the obvious specters of *World Dynamics* and *The Limits to Growth* hung ominously. Speaking for Brazil and on behalf of the world's LDCs, Castro argued in the spring issue of Cambridge University's *International Organization* journal that the "developing countries, while rejecting the implementation of any ecological policy which bears in itself elements of socioeconomic stagnation, could only share a common responsibility for the preservation of the environment if it was accompanied and paralleled by a corresponding common responsibility for development." Each country, he explained, "must evolve its own development plans, exploit its own resources as it thinks suitable, and define its own environmental standards." Any notion of having those priorities or standards imposed on nations or groups of nations was unacceptable. "Ecological policies," he declared, "should rather be inserted into the framework of national development."[427] It was on that framework, and on that framework alone, on which LDCs like Brazil agreed to build the foundations of international environmental policy in Stockholm.

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After years of advocacy, Brazil and other LDCs had successfully established the boundaries of the UNCHE around their priority of development, even as events

[427] Joao Agusto de Aruajo Castro, "Environment and Development: The Case of the Developing Countries," in *World Eco-Crisis: International Organizations in Response*, edited by David A. Kay

outside the UN encouraged continued questioning on the role of economic growth. Brazil's message to synthesize development with environment was clear. Yet, in their UN speeches, in the Founex report, in the UN resolutions they inspired, and even in the recent statement by African experts, no clear description appeared for *how* to combine continued economic development with environmental protection. Instead, LDCs during the UNCHE planning process expressed their belief that development and environment *could* be combined in a way to optimize both ecological and economic systems. LDCs' demands that development become the central component of environmental planning seemed to envision the achievement of industrialization without side-effects, but no one ever explained how this idealized alteration to development would occur. Without a clear conception for how to combine a sustainable environment with sustained development, expressions that no conflict existed between development and environment remained pure statements of faith.[428] And it was under the rubric of this faith that 114 members of the UN would meet in Stockholm to address the future of the Human Environment.

Despite the UNCHE's inability to question the role of economic development as part of global environmental policymaking, Chapter 6 shows how the actual events that occurred in Stockholm during the UNCHE's ten days of meetings included some surprises and unexpected conflicts. Similar conflicts unfold in Chapters 7 and 8, which expand back in time and place to explore the developments leading to two alternative conferences in Stockholm, as well as what occurred at

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and Eugene B. Skolnikoff (Madison: University of Wisconsin Press, 1972), 237-252; quotes on 250, 248. This book reproduces the Spring 1972 issue of *International Organization.*

Stockholm in the summer of 1972. The remaining chapters thus analyze how the global environmental moment climaxed in Stockholm, where national governments, non-governmental environmental actors, and leading environmental scientists all met in hopes of saving Spaceship Earth from destruction, while also seeking to serve their own individual political aims.

[428] W. M. Adams, *Green Development: Environment and Sustainability in a Developing World*, Third Edition (New York: Routledge, 2009), 60-61.

Chapter 6

A HUMAN ENVIRONMENT:
How Nations United in Stockholm

"Stockholm is a battlefield of conflicting reports, recommendations and manifestos. … The most basic dispute at Stockholm, however, involves money."
— "Woodstockholm," *Time*, June 19, 1972.

"A country that has not yet achieved a minimum standard of living is not in a position to spend its valuable resources protecting the environment."
— General Jose da Costa Cavalcanti, Brazil's Minister of the Interior, plenary speech at UN Stockholm Conference, June 1972

After several decades of conceptual and scientific framing for "seeing" the global systems of Spaceship Earth and recognizing environmental threats to those planetary systems, and after several years of intense planning processes within the United Nations (UN), the environmental circus in Stockholm finally commenced in the summer of 1972. As Maurice Strong's senior information advisor Peter Stone described it, Stockholm proceeded like a giant circus within a set of inner rings and outer rings. Britain's Stanley Johnson described Stockholm as "a gigantic ritual, a three-ring circus played out in the three conference sites."[429] The remaining chapters describe the events and conflicts that occurred in Stockholm during its environmental circus, in both its inner and outer rings. The last two chapters, Chapters 7 and 8, step back in time to explore events that produced to two alternative gatherings in Stockholm, as well as proceeding to address the events that actually occurred in those outer rings at Stockholm. However, this chapter details and

[429] Stanley Johnson, "Stockholm Roundup," *New Statesman*, June 16, 1972; Peter Stone, *Did We Save the Earth at Stockholm?* (London: Earth Island Ltd., 1973), 132-133.

analyses events at the center attraction of Stockholm's environmental circus—the main event of its inner ring—the United Nations Conference on the Human Environment (UNCHE).

From June 5 to 16, 1972, during the UNCHE, some 1,200 delegates from the governments of 114 nations, nineteen intergovernmental agencies, and over 400 officially UN-recognized non-governmental organizations met in Stockholm, Sweden to discuss for the first time at a UN intergovernmental forum how the world community should take its first steps toward corrective action against problems of the global environment. The optimists promoting the UNCHE hoped that the shared environmental threats facing the world's nations might provide a common bond by which sovereign nations might subordinate some of their individual interests to the global cause of environmental survival.[430] The end of the UNCHE would realize those hopes for global environmental unity, but only on the surface. Instead, self-interested political conflict permeated Stockholm's inner ring, but it did so in ways not entirely expected by nations like the United States and Brazil who had worked hard before the UNCHE to shape what would occur there.

Despite Stockholm's surprises and, ultimately, what I describe here as its failures to move beyond rhetoric and toward actual action on global environmental problems, the UNCHE remains celebrated as a success in much academic literature. Political scientists interested in the international realm of environmental protection

[430] For instance see the comments by U Thant on the hopes and needs for the UNCHE in Louis B. Sohn, *The United Nations: The Next Twenty-Five Years, Twentieth Report of the Commission to Study the Organization of Peace* (New York: Commission to Study the Organization of Peace, 1969); U Thant, "Secretary-General's Response to Environmental Scientists," May 11, 1971, UNARMS, accessed February 27, 2011, http://archives-trim.un.org/webdrawer/rec/422866/.

and politics typically hail the UNCHE as a seminal event and a resounding success. Political scientist Caroline Thomas championed the Stockholm Conference as "a milestone in the recognition of environmental issues in international relations," while fellow political scientist Marvin S. Soroos christened it a "major landmark" in the history of building global environmental institutions. In his memoirs, Maurice Strong also praised it as "a major landmark launching a new era of international environmental diplomacy." Political scientist John McCormick named the UNCHE "the single most influential event in the evolution of the global environmental movement, and of a global environmental consciousness."[431]

As evidence, these scholars celebrate the UNCHE for adopting a Declaration on the Human Environment, consisting of a preamble and twenty-six principles that aimed to provide "a common outlook … to inspire and guide the peoples of the world in the preservation and enhancement of the human environment."[432] The numerous nations at the Conference also agreed upon 109 separate recommendations in an Action Plan intended as a blueprint for launching a coordinated international attack on environmental challenges and a baseline for future environmental agreements. The plan included creation of a new global environmental monitoring system called Earthwatch to assess the condition of the global environment, evaluate

[431] Caroline Thomas, *The Environment in International Relations* (London: Royal Institute of International Affairs, 1992), 21; Marvin S. Soroos, "Global Institutions and the Environment: An Evolutionary Perspective," in *The Global Environment: Institutions, Law and Policy*, edited by Norman J. Vig and Regina S. Axelrod (Washingon, DC: Congressional Quarterly Press, 1999), 27-51, here 28; Maurice Strong, *Where on Earth Are We Going?* (New York: Alfred Knopf, 2000), 131. John McCormick, *The Global Environmental Movement* (West Sussex, UK: John Wiley & Sons, 1995), 127. See also, Lynton Caldwell, *International Environmental Policy: Emergence and Dimensions* (Durham: Duke University Press, 1990).

data, and exchange information. In answer to additionality, the UNCHE secured the inception of a special Environment Fund, proposed under U.S. initiative and intended to reach $100 million over the ensuing five years, to cover Earthwatch's operational costs. However, one observer wondered what practical effect Earthwatch would have. "The image that comes to mind is of a man who is given a thermometer and a fever chart to see him through a serious illness."[433]

Yet the UNCHE's most conspicuous accomplishment was instituting a permanent UN-based environmental secretariat and Governing Council for Environmental Programs with a rotating committee originally of forty-eight (later expanded to fifty-eight) nations. A year after the UNCHE concluded, this council became the United Nations Environment Program (UNEP). Despite protests by existing UN organizations, UNEP established an entirely new intergovernmental body within the UN to coordinate international environmental activities.[434] Political scientists often commemorate UNEP for launching an institutional approach to common international environmental problems and celebrate the UNCHE as a seminal first step toward solving those problems.

Viewed through a different lens, however, the UNCHE can be seen equally as a limitation on international environmental action, as a means of closing options and of institutionalizing creative thought for solving global environmental challenges

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[432] United Nations, *Report of the United Nations Conference on the Human Environment held at Stockholm, 5-16 June 1972: Action Taken by the Conference,"* UN General Assembly document A/CONF.48/14 (July 3, 1972).

[433] Friedel Ungeheuer, "A Stockholm Notebook," *Time*, June 26, 1972, 40-43, here 40.

[434] Nigel Hawkes, "Stockholm: Politicking, Confusion, but Some Agreements Reached," *Science* 176:4041 (June 23, 1972), 1308-1310. Regarding the U.S.-proposed environment fund, the United States proposed to contribute $40 million on a matching basis, Japan promised $10 million, Canada promised $5 to $7.5 million, and Sweden $5 million.

within the bounded structures of the UN. In one of the few critical analyses of the UNCHE, political scientist Lee-Anne Broadhed argued that "what happened in Stockholm was the start of the absorption of critical thinking that was attempting to call into question the basic assumptions of modernity that can be seen as the root of the problem."[435] Among the reasons why most political scientists celebrate the UNCHE's accomplishments on paper, rather than recognize its constrictions, is their lack of focus on the details of the UNCHE.

They tend to overlook the UNCHE's challenging preparatory process in which LDCs, with Brazilian leadership, captured and re-oriented the conference's agenda against international standards, away from global conventions, and as a means to promote their own development. They also tend to overlook the rhetoric and events of the Conference itself, including the details of the UNCHE's final agreements. Such a detailed focus, however, reveals on-going conflict over the issues of growth while also highlighting the ultimate triumph by an assortment of LDCs in securing their development-focused rhetoric in the UNCHE documents and in the location of the UN's ensuing environmental institutions. Securing LDC rhetoric in the UNCHE documents, however, was not the same thing as securing their development demands in reality. As a result, the success and legacy of the UNCHE remains mixed at best and, at worse, an utter failure in terms of the existing inability for unified action on global environmental protection today.

[435] Lee-Anne Broadhead, *International Environmental Politics: The Limits of Green Diplomacy* (Boulder, CO: Lynne Rienner Publishers Inc., 2002), 39.

Commencing the UNCHE, Still Debating Growth

The UNCHE proceeded in stages at various locations. The center of attention and the greatest publicity centered on the conference plenary sessions, which all delegates attended and where each nation delivered their government's statement on global environmental issues. The Plenary also heard from special invited guests, ranging from leading NGOs on environmental issues and key figures like Barbara Ward, to awkward environmental groups like the Boy Scouts and the pacifist International Fellowship of Reconciliation.[436] Additional work toward the Action Plan in the UNCHE's major agenda issues—human settlements; natural resources management; control of international pollution; educational, information, and socio-cultural aspects of the environment; international organizational implications; and development and environment—occurred in separate committees beyond the main plenary hall. The committees witnessed bland re-wording of Action Plan recommendations while the plenary hosted the UNCHE's most memorable speeches.

Strong opened the UNCHE on June 5, 1972with a plenary speech that carved middle ground between the conference's underlying North-South tensions. Strong outlined the purpose of the UNCHE as seeking "to reconcile man's legitimate, immediate ambitions with the rights of others, with respect for all life supporting systems, and with the rights of generations yet unborn." On behalf of all of Spaceship Earth's passengers, he expressed a wish "to advance—not recklessly, ignorantly, selfishly and perilously, as we have done in the past—but with greater understanding, wisdom and vision. We are anxious and rightly so, to eliminate

poverty, hunger, disease, racial prejudice and the glaring economic inequalities between human beings." With the recent publication and global buzz around *The Limits to Growth* report and *A Blueprint for Survival*, Strong felt pressed to address the issue of economic growth head on. Rather than end growth, as suggested by some radical environmentalists, Strong suggested reconceptualizing it. One of the most promising aspects of the debate on development and environment, he proclaimed, was its newly emerging yet still unclear synthesis. "There is still unresolved controversy over the concept of growth," Strong admitted. But he definitively stated, "I do not believe we can cease to grow—no growth is not a viable alternative." Development must proceed, but only when considered in dynamic harmony with nature. "To achieve this," Strong stated, "we must control and redirect our processes of growth. We must rethink our concepts of the basic purposes of growth." To do so, he warned, the world's wealthy nations "will have to make the most profound, even revolutionary changes in attitudes and values."[437] Though speaking collectively for the world, Strong was not the only citizen from the North in a position of power who questioned growth in Stockholm.

Buichi Oishi, the head of the Japanese delegation and Japan's Minister of State for Environmental Affairs delivered an ominous address on Japan's industrial history and its recent environmental challenges. He explained how "the Japanese people, who had thought that greater production and greater GNP are the guidelines

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[436] See Chapter 7 for more on the International Fellowship of Reconciliation and its relationship vis a vis the UNCHE.

[437] Maurice Strong, "Opening Statement to the United Nations Conference on the Human Environment," June 5, 1972, http://www.mauricestrong.net/index.php/speeches-remarks3/103-stockholm, accessed December 30, 2013.

for human happiness and had passionately bent their efforts to those objectives, were disillusioned and awakened to their mistaken idea." Instead, he warned, "the pollution of the environment has caused a serious hazard to human health and lives." In the wake of their painful experiences with toxic illness and chemical poisons, Oishi noted how Japan people's began asking, "GNP for whom? For what?" As a result, he disclosed, "Japan's politics has been re-oriented from priority on economic growth to respect for human life." Oishi retold the industrial experience of Japan to sound a warning for LDCs seeking rampant growth.[438]

Sicco Mansholt, the newly elected president of the European Common Market Commission, which later evolved into the European Union, shared similar concerns. As a Dutch farmer who witnessed the dreadful famine in the wake of World War II, Mansholt suggested the reexamination of uncontrolled growth in light of his fears about dwindling resources and the potentially violent consequences of the growing gap between rich and poor nations. Mansholt told the hundred-plus nations at the UNCHE that "we must ask ourselves whether we can continue to pursue our economic growth, at least along present lines; … whether our present social structure and production processes are still defensible; … whether we in the rich countries are willing to face the consequences or will take refuge in a fight against symptoms to avoid answering the question."[439] Clearly influenced by publications from the Club of Rome, Mansholt suggested a planetary shift from growth to equilibrium.

[438] "Buichi Oishi, Japan: GNP—For Whom? For What?," *Bulletin of the Atomic Scientists*, September 1972, 51-52.

However, Robert McNamara, then president of the World Bank, suggested modifications to growth, not the end of it. McNamara still stressed the interdependencies inherent in the symbol of Spaceship Earth. "But what we must not forget," he cautioned, "is that one quarter of the passengers on that ship have luxurious first-class accommodations and the remaining three-quarters are traveling in steerage." On behalf of the World Bank, McNamara declared economic growth in LDCs as essential to deal with their human problems, including environmental ones, and that properly planned growth need not cause unacceptable environmental harm. Moreover, he admonished rich nations to assist LDCs in achieving high economic growth with low environmental harm through additional, even if minimal, aid.[440] The issue of growth echoed in the halls of the UNCHE plenary, even if the draft text of the Declaration and Action plan had been securely formulated in the lengthy preparation process.

As expected, the LDC architect of that planning process, Brazil, delivered a plenary speech that also took a clear stance on growth. Brazil's Minister of the Interior, José Costa Cavalcanti, headed his nation's delegation and spoke before the plenary. Rather than address environment protection, Cavalcanti remained focused on the imperative of growth. "To combat pollution," he announced, "is to create industries, to create jobs, to combat misery, to favor health, to promote education." As in Maurice Strong's opening statement, Cavalcanti announced no-growth as not an option. "Economic development must be faced in the future," he stated, "as a

[439] Quotes by Mansholt from Claire Sterling, "Rich Nations Warned To Curb Growth Rate," *Washington Post*, June 9, 2013, A24

conciliation between the necessity of increasing the productivity of man to assure his well-being and dignity, and the necessity of reducing to the minimum the predatory aspect that progress has assumed in the past." After all, he continued, "it was economic growth that allowed the developed countries to show great progress in eliminating mass poverty, ignorance, and disease." Remaining on key with prior Brazilian announcements, Cavalcanti stated that if the rich nations wanted environmental protections for themselves and for the world's majority, those wealthy countries should "therefore assume major responsibilities for the necessary corrective actions, as well as for making up for what has been damaged." He concluded that "a country that has not yet achieved a minimum standard of living is not in a position to spend its valuable resources protecting the environment." As such, Brazil would spend toward its own development, and the wealthy nations should help. Brazil had fought hard through two years of UNCHE planning to secure the language embodied in the draft Declaration and Action Plan. They worked to ensure the UNCHE would enshrine those victories remained as the bedrock of future environmental diplomacy.[441]

In the plenary, the United States, struck a pragmatic—even conciliatory—tone. Russell Train of Nixon's CEQ chaired the large U.S. delegation, with the State Department's Christian A. Herter, Jr. as vice-chair. In the absence of the Soviet Union, Train's straightforward plenary speech noted American global leadership and

[440] Quotes by McNamara from Claire Sterling, "Rich Nations Warned To Curb Growth Rate," *Washington Post*, June 9, 2013, A24.

[441] José Costa Cavalcanti speech quoted in Roberto P. Guimarães, *The Ecopolitics of Development in the Third World: Politics and Environment in Brazil* (Boulder, CO: Lynne Rienner Publishers, Inc., 1991), 152.

progress, particularly in their global quest for environmental protection and for a better quality of life. Train's plenary reiterated American commitment on a matching basis to an Environment Fund; supported creation of a UN environmental secretariat; encouraged a coordinated environmental monitoring network; backed the prevention of ocean dumping; and promoted Nixon's proposal for a World Heritage Trust. He also told delegates, "The fact of national sovereignty entails frank recognition that many or even most of the crucial environmental actions have to be taken freely by governments and by citizens in their own interest as they see it." Uniform pollution standards, he capitulated, were "not practical or appropriate at this time … [although] it is important that every effort be made to harmonize differing national environmental policies." Train reiterated American commitment to national sovereignty even if it limited the potential of international cooperation, a message that seemed to cater to the world majority of LDCs at the UNCHE.[442]

While pragmatic in the plenary, however, American delegates appeared bullish and intransigent in committee debates, particularly against Action Plan recommendations for additional funding of LDCs. Back in Washington, as the conference got underway, Henry Kissinger reminded President Nixon of Russell Train's multi-year preparations for the UNCHE and reiterated that the overall U.S. objectives for the UNCHE were "to raise the level of national and international awareness and understanding of environmental problems and to increase national,

[442] Russell E. Train, United States: The United States Position," *Bulletin of the Atomic Scientists*, September 1972, 43-44. Train's speech was written by William K. Reilly, a young member of Nixon's CEQ, later Administrator of the Environmental Protection Agency under George H.W. Bush, and head of the U.S. delegation to the Rio Earth Summit at the UN Conference on Environment and Development in 1992. See Hopgood, *American Foreign Environmental Policy,* 101, fn14.

regional and global capabilities to recognize and solve problems that seriously degrade the environment. "By doing so," Kissinger's memo explained, "we will maintain and improve our overall international economic, competitive position as other countries adopt control measures comparable to our domestic programs."[443] The United States realized that the UNCHE would set a precedent for international environmental politics, and allowing international precedents on additionality would complicate achievement of American economic goals. The United States thus sought for the UNCHE to raise environmental awareness, but it would give only limited additional money in the Environment Fund as a means to secure American economic hegemony.

As a result, during early Conference debates in Stockholm, the United States offered amendments to quell each of the four specific Action Plan proposals on additionality. One American delegate defended U.S. intransigence by stating, "We expect the LDCs to fight tooth and nail to get special treatment and exemption from environmental standards." He continued, "While we really want to go as far as we can to be accommodating, we must draw the line. Even if we are dealing simply with recommendations here, not formally binding on any government, we cannot accept the setting of such precedents for the next round of … negotiations on international trade. We simply do not want our hands tied."[444] Toward those ends, on the second day of the UNCHE, in the Second Committee on Environment and Development, the

[443] Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 323, Memorandum From the President's Assistant for National Security Affairs (Kissinger) to President Nixon, Washington, June 8, 1972: U.S. Preparations for UN Environmental Conference.

U.S. delegation worked especially toward revising the additionality principle in recommendation 103, which stated "that where environmental concerns lead to restrictions on trade, or to stricter environmental standards with negative effects on exports, particularly from developing countries, appropriate measures for compensation should be worked out."[445] However, all of the American amendments were defeated by majorities of thirty-five or more nations, mostly but not all LDCs.

Virtually all other nations—including other industrialized aid-giving allies like Britain, Italy, West Germany, Canada, and Japan—had endorsed the principle of additionality and gone on record as favoring increased international aid to support LDCs in accomplishing necessary environmental adjustments. Two U.S. delegates, Senators Clairborne Pell and Clifford Case, recalled in their report to the Senate that, "unfortunately for the U.S. image, the American delegation was operating under strict instructions from the [Nixon] Administration to vote against any proposals that would increase aid to the developing nations." U.S. delegates must oppose any forms of additionality beyond their offered contributions to the proposed Environment Fund, even though that U.S. offer was paralleled by its freeze in increments for funding environmental projects in other UN specialized agencies. Those instructions, the Senators claimed, "left the U.S. delegation in singular dissent on a number of issues."[446] As a result, the *Washington Post*, which described U.S. delegates as

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[444] Anonymous U.S. delegate quoted in Claire Sterling, "U.S. Losing Argument with Poor Nations at Stockholm," *Washington Post*, June 8, 1972, A29.

[445] United Nations, *Report of the United Nations Conference on the Human Environment held at Stockholm, 5-16 June 1972: Action Taken by the Conference,"* UN General Assembly document A/CONF.48/14 (July 3, 1972), Action Plan Recommendation 103, 26.

[446] "Report to the Senate by Senator Clairborne Pell and Senator Clifford Case, Members of the Delegation of the United States at the United Nations Conference on the Human Environment, Held

"harried and weary," recorded backroom comments by U.S. allies describing American positions as "pigheaded," "stiff-necked," "mulish," and "short-sighted."[447] While most American allies relegated their off-the-record comments to committee hallways, other nations proclaimed their displeasure with the United States publically.

American Ecocide and China's Invective

As the host nation for the UNCHE, Sweden's Prime Minister, Olaf Palme, accepted the early honor of addressing the assembled world representatives in Stockholm. As leader of Sweden's Social Democrat Party, Palme emphasized how his government placed "the greatest importance to the stress laid in the Declaration upon the need for development." Palme spoke on the need for greater equality and distribution of resources, and he quoted the draft Declaration, which lamented continued consumption of immense resources for environmentally damaging military armaments rather than ecological restoration. Then, to the surprise of the plenary and without overtly naming the United States, Sweden's head of state openly chastised the UN for a glaring absence in the draft Declaration: its avoidance of the environmental horrors inflicted by the war in Indochina. "The immense destruction brought about by indiscriminate bombing, by large scale use of bulldozers and herbicides is an outrage sometimes described as ecocide," Palme declared. He was shocked that only preliminary discussions on this issue had occurred in the UN. "It is

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in Stockholm, June 5-16, 1972," Committee on Foreign Relations, US Senate, 92nd Congress, Second Session, October 1972 (Washington DC: U.S. Government Printing Office, 1972), 9.

of paramount importance," he concluded, "that ecological warfare cease immediately."[448] For several years, Swedish leaders had criticized U.S. involvement in Vietnam and American scientists had fought a protracted campaign against the use of herbicides, in which they had invented the term "ecocide."[449] But tacit evasion of Vietnam had been a precondition for American participation in the UNCHE. Few expected such accusations to appear there, and certainly not from the host nation's head of state.

Russell Train became visibly incensed at Palme's plenary provocation. U.S. delegates nearly walked out, and they received White House instructions to threaten as much if criticisms did not subside inside the Conference.[450] Things were already bad enough outside it. Several hundred environmental activists had descended on Stockholm in hopes of participating or protesting the first worldwide environment conference, many of whom conflated their environmental activism with their opposition to the Vietnam war. The streets of Stockholm were filled with protestors just as likely holding signs in Swedish or English that read, "Long Live the Earth," as they did signs announcing, "United States: Stop Polluting Vietnam with Dead

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[447] Claire Sterling, "U.S. Losing Argument with Poor Nations at Stockholm," *Washington Post*, June 8, 1972, A29.

[448] "Olaf Palme, Sweden: The Outrage of Ecocide," *Bulletin of the Atomic Scientists*, September 1972, 44-45; Joe Alex Morris, Jr., "Sweden Demands Halt to 'Ecocidal Warfare,'" *Los Angeles Times*, June 7, 1972, A5.

[449] Fredick Logovall, "The Swedish-American Conflict over Vietnam," *Diplomatic History* 17 (June 1993): 421-445; David Zierler, *The Invention of Ecocide: Agent Orange, Vietnam, and the Scientists Who Changed the Way We Think about the Environment* (Athens, GA: University of Georgia Press, 2011), 163-164.

[450] Stephen Hopgood, *American Foreign Environmental Policy and the Power of the State* (Oxford: Oxford University Press, 1998), 101, fn13.

Bodies."[451] Palme's accusation of ecocide inside the Conference shocked the American delegation, as did his suggestion to insert such radical language into the fragile draft Declaration.

The following morning, Russell Train called a special news briefing to denounce Palme, stating in a bitter tone how "the Prime Minister of Sweden took it upon himself to inject a highly emotional issue into the proceedings," and the United States took "strong exception" to both his "charges of ecocidal warfare" and "gratuitous politicizing of our environmental discussions." Train announced, "I am personally an environmentalist, not a politician. I wish to see the UN Conference on the Human Environment a success. … The injection of a highly charged issue can only do a disservice to this objective."[452] Yet Sweden was not the only nation at the UNCHE to level overt accusations against the United States. To American dismay, so did China. While China and the United States were both pro-growth and recently initiated a new détente, China saw the UNCHE as a major opportunity to boost its credentials as a radical communist power on a global stage.

China's attendance to the UNCHE marked its first appearance in a major UN meeting since the creation of the UN more than two decades earlier. For most of those years, Taiwan (under its official name as the Republic of China) occupied the Chinese spot at the UN and its influential seat in the UN Security Council. However, President Nixon's visit to the mainland People's Republic of China in February

[451] See photographs accompanying Claire Sterling, "U.S. Backs Ecology Talks, Limits Committments," *Washington Post*, June 7, 1972, A16; Terri Aaronson, "World Priorities," *Environment* 14:6 (July/August 1972), 4-13.

[452] "Response of Russell E. Train, Chairman, United States Delegation," *Bulletin of the Atomic Scientists*, September 1972, 45.

1972, four months before the UNCHE, propelled the People's Republic back in the mainstream international political order. Nixon had announced his planned visit to China in July 1971, and by October 1971, the People's Republic resumed all its legal rights in the UN. When new UN Secretary-General, Kurt Waldheim formally invited China to the UNCHE, Beijing placed great value on the overture.[453]

Chinese Premier Zhou Enlai considered the UNCHE an opportunity to reestablish political and economic ties with the rest of the world, while also affirming the superiority of the socialist system for securing environmental protection. This opportunity became even greater when the Soviet Union and its European allies announced their boycott of the UNCHE over the status of East Germany. Zhou ensured a large and diverse Chinese delegation would attend the UNCHE, including representatives from various Chinese ministries. Before they headed to Stockholm, Zhou told them not to overstate China's achievement and to learn from the experience of the advanced industrial nations; but he also said they should voice China's support for all people harmed by pollution, particularly those in the Third World, as part of an "environmental justice movement."[454] The environmental moment, it seemed, even briefly influenced China's leadership. Yet, the environmental circus in Stockholm provided too great a geopolitical opportunity for China to emphasize the environment. Several observers at the UNCHE considered China's actions in Stockholm "as a bid for leadership of the Third

[453] Bao Maohong, "The Evolution of Environmental Problems and Environmental Policy in China: The Interaction of Internal and External Forces," in *Environmental Histories of the Cold War* (New York: Cambridge University Press, 2010), 323-340.

World," particularly China's vitriolic attacks against the United States.[455] China's first action at the UNCHE, however, was to call into question the prior consensus reached on the draft Declaration, in which more than 100 widely disparate nations sought agreement on a few general environmental principles.

On the fourth day of plenary proceedings, Tang Ke, the chairman of the Chinese delegation and Chinese vice-minister of fuel and chemical industries, suddenly asked for the floor midway through a long pre-established list of speakers. To everyone's surprise, China's first comments to the Conference resolved to re-open debate on the delicate draft Declaration on the Human Environment. Tang Ke explained that China did not have the opportunity to debate the draft Declaration due to its late invitation, nor had other nations excluded from the UNCHE's twenty-seven nation Preparatory Committee. He noted that the Declaration, as the defining document of the Conference, should offer important guiding principles, but it needed to better address Third World concerns. After all, he said, the Declaration must "rally the support of the majority if it were to have any moral effect." Delegates from Iran and Algeria immediately concurred and proposed a special Working Group for all nations to submit new amendments to the draft Declaration. Argentina also agreed, noting that the draft Declaration had been merely transmitted, not approved,

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[454] Bao Maohong, "The Evolution of Environmental Problems and Environmental Policy in China: The Interaction of Internal and External Forces," in *Environmental Histories of the Cold War* (New York: Cambridge University Press, 2010), 323-340.

[455] For critical media appraisal of China at the UNCHE by those who witnessed it, see Claire Sterling, "Chinese Rip U.S. at Parley," *Washington Post*, June 10, 1972, A1; Claire Sterling, "Chinese Attack on U.S. Endangers Declaration on Environment," *Washington Post*, June 11, 1972, A9; Nigel Hawkes, "Stockholm: Politicking, Confusion, but Some Agreements Reached," *Science* 176:4041 (June 23, 1972), 1308-1310; Terri Aaronson, "World Priorities," *Environment* 14:6 (July/August 1972), 4-13; Tim E.J. Campbell, "The Political Meaning of Stockholm: Third World Participation in

in the Preparatory Committee. Sudan, speaking on behalf of the Africa group, and the Philippines, speaking for the Asian group, all supported the Chinese proposal.[456]

Fearing rupture and hoping to calm the rising storm, an American representative expressed concern that the UNCHE would become overburdened by reopening the Declaration debate, as it had taken more than a year to forge that draft. He recalled Maurice Strong's warning to respect the fragility of the compromise already reached. Canada said the draft Declaration was more than an inspirational message or educational tool, that it represented the first step in developing international environmental law. Any nations "that disturbed the delicate balance of the existing draft would carry a heavy responsibility." However, Canada felt it unfair to deny delegations who had not participated in elaborating the draft to express their views. Norway, Denmark, Italy, and Switzerland all expressed trepidation at re-opening discussions on the draft. The representative from Singapore admitted the draft Declaration was not a perfect document but it represented a careful balance between the interests of the developed and developing nations. However, none who expressed their reservations to the Chinese proposal would stand against it. In the absence of objections, the Chinese resolution passed and a Working Group began deliberations on the draft Declaration the following day.

Just as the American delegation feared, re-opening discussion on the Declaration threatened to swamp its approval before the end of the UNCHE, thereby

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the Environment Conference Process," *Stanford Journal of International Studies* 8 (Spring 1973), 138-153.

[456] United Nations, *Report of the United Nations Conference on the Human Environment held at Stockholm, 5-16 June 1972: Action Taken by the Conference,"* UN General Assembly document A/CONF.48/14 (July 3, 1972), 49-50.

jeopardizing the success of the Conference. During the first full day of closed debate on the newly opened Declaration, China sought to further elevate its Third World credibility with a scathing attack against American policies in Indochina. The Chinese desired explicit language inserted into the Declaration recognizing the primary "social" cause of environmental pollution as "the policy of plunder, aggression, and war carried out by imperialist, colonialist, and neo-colonialist countries, especially by the superpowers." Furthermore, if the Conference proceeded to vote on Declaration principles for which full agreement had not been reached, the Chinese delegation announced it would simply not participate in the voting.[457] The exasperated American delegation was baffled and hinted as the possibility of walking out again. Questioned by the press as to the American reaction, especially in the wake of Nixon's famous visit to China a few months earlier, one U.S. delegate wistfully sighed, "I wish the Russians were here."[458]

The morning after the Chinese delegation's closed-door assault, Tang Ke moved China's critiques into the open during his plenary address, which the 1200 international journalists attending the UNCHE enjoyed as a present to the press. Wasting little time, Tang Ke declared China's position that "increasingly serious pollution and damage of the human environment … is mainly the result of the development of capitalism into imperialism," namely by the superpowers. In his next breath, Tang Ke decried America's "barbarous atrocities" in Vietnam, which resulted in "massive killings of innocent old people, women, and children, as well as

[457] United Nations, *Report of the United Nations Conference on the Human Environment held at Stockholm, 5-16 June 1972: Action Taken by the Conference,"* UN General Assembly document A/CONF.48/14 (July 3, 1972), 63.

unprecedented and serious destruction of the human environment." China called upon the UNCHE to strongly condemn the United States for its "wanton bombing and shelling, use of chemical weapons, massacre of the people, destruction of human lives, annihilation of plants and animals and pollution of the environment." And while other nations spoke on Spaceship Earth's imperatives of interdependence, China affirmed the right of LDCs "in building their national economies on the principle of independence, exploiting their natural resources in accordance with their own needs." Tang Ke denounced the claim that population growth as a factor for environmental pollution, described Earth's resources as inexhaustible, and declared that future technology would be able to clean up any environmental dislocations caused by industrial expansion.[459]

On the topic of unrestricted development, despite its environmental impact, Tang Ke announced, in a phrase worthy of Chairman Mao, that, "One does not stop eating for fear of choking." Tang Ke firmly told the UNCHE attendees that, "each country has the right to determine its own environment standards and policies in the light of its own conditions, and no country whatsoever should undermine the interests of the developing countries under the pretext of protecting the environment." And on the issue of additionality, China believed that LDC "victims" of superpower aggression and environmental plunder "have the right to apply sanctions against and demand compensation from those culprit countries which encroach on their sovereignty, damage their resources, and pollute and poison their

[458] Claire Sterling, "Chinese Rip U.S. at Parley," *Washington Post*, June 10, 1972, A1.
[459] Tang Ke, People's Republic of China: The Case of China," *Bulletin of the Atomic Scientists*, September 1972, 54-55.

environment."[460] At its first major UN event, China made its presence and positions both loud and clear.

The U.S. delegation did not know quite how to respond. Nixon and Kissinger's visit with Chairman Mao in Beijing just months earlier had inaugurated a historic new U.S. policy of détente and *rapprochement* with China. In Stockholm, the State Department's Christian Herter twice announced and then twice canceled a media briefing for the U.S. delegation's rebuttal, reflecting the American's confusion. When the U.S. reply finally came, it was surprisingly muted, particularly compared to the barbed reply Olaf Palme earned for his much more mild address. Russell Train told the media in Stockholm that the United States simply found the Chinese address "regrettable" and "inappropriately laden with political and ideological invective." The common goal of a successful UNCHE, Train maintained, would not be served "by bringing into our deliberations highly charged issues, extraneous to our agenda and impossible to solution in this forum."[461] For the White House, cultivating nascent relations with China remained far more important than issuing a biting retort in a UN conference.

Rather than intensify an already tenuous situation at the UNCHE, or exasperate a geopolitical row in a clearly delicate Chinese relationship, the U.S. delegation chalked up China's outburst as a public bid for LDC authority. Christian Herter's classified report after the UNCHE explained that, China, "from the outset of the Conference sought to establish a leadership role with the Third World,

[460] Ibid.
[461] "Response of Russell E. Train, United States," *Bulletin of the Atomic Scientists*, September 1972, 55.

particularly the Africans and Asians."[462] Instead retaliating, the U.S. delegation would put it efforts into securing other successes in Stockholm. Thankfully, not all of the UNCHE boats were sinking. After some seventy to eighty hours of negotiations that began before the UNCHE and continued into it, those Action Plan successes included what Christian Herter called "an extraordinarily good compromise" on establishing the new UN environmental secretariat, as well as progress on the Environment Fund and approval for establishing a World Heritage Trust.[463]

However, in the newly formed Working Group on the Declaration, debates appeared increasingly intractable. Emboldened by the radical Chinese posture, several LDCs moved to rewrite the declaration to make it pointedly anti-superpower and even more pro-LDC. With the floodgates opened for revisions and new amendments, the second day of renewed debate on the Declaration saw twenty-seven new amendments from fourteen different countries, which affected all but three of the existing twenty-three articles in the draft document. As the days of debate continued, the Working Group saw some forty new amendments and seemingly endless nit-picking revisions proposed, picked-apart, discarded or incorporated, and replaced by new ones. China's bold move to re-open debate galvanized LDCs to reiterate their views in revising the Declaration. However, the process moved slowly. The *Washington Post* reported that, "barring a miracle of reconciliation, this would

[462] Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 325, Classified Report of the Vice-Chairman of the UN Conference on the Human Environment from Delegation (Herter) to Secretary of State Rogers, Washington, July 28, 1972.

[463] Claire Sterling, "Conference Hits Nuclear Tests," *Washington Post*, June 13, 1972, A24.

almost certainly kill any chances of agreement" before the Conference's close. Even the indefatigable Maurice Strong feared agreement on a revised Declaration would prove impossible.[464]

Compromise and Compassion in the Spirit of Stockholm

Just past the UNCHE's midway point, Charles Bierbauer, a correspondent for *Environment Action Bulletin*, described Stockholm as "gill-high in a river of rhetoric, largely polluted with political and emotional issues." Rather than the stately symposium he hoped would alleviate the planet's environmental crisis, he instead saw a collection of "chaos, power plays, reams of meaningless rhetoric, waste, and toothless resolutions." Nigel Hawkes, for the journal *Science,* attested that, "so confused did the conference become that at times even the delegates themselves were not quite sure what they had approved." And in the plenary, an endless tide of speeches spurred Barbara Ward's comment that, in Stockholm, "Truth is moving to platitude with alarming speed."[465] As for the Working Group on the Declaration, it met no less than fifteen times between June 9 and 15 in failed attempts to resolve its conflicting positions. Late in the UNCHE's second week the *Stockholm Conference Eco*—a snarky and unofficial Conference newspaper co-published by *The Ecologist* magazine and Friends of the Earth—declared in its front headline, "Declaration

[464] Claire Sterling, "Chinese Attack on U.S. Endangers Declaration on Environment," *Washington Post*, June 11, 1972, A9; Roberto P. Guimarães, *The Ecopolitics of Development in the Third World: Politics and Environment in Brazil* (Boulder, CO: Lynne Rienner Publishers, Inc., 1991), 145, 156.

[465] Charles Bierbauer, "UN Conference: Reams of Rhetoric, Little Action," *Environment Action Bulletin* 3:26 (June 24, 1972), 1; Ward quoted in Friedel Ungeheuer, "A Stockholm Notebook," *Time*, June 26, 1972, 40-43, here 40; Nigel Hawkes, "Stockholm: Politicking, Confusion, but Some Agreements Reached," *Science* 176:4041 (June 23, 1972), 1308-1310, here 1308.

Dismembered." The next day, the *Eco*'s front headline wondered, "Declaration Dead?" So unclear was the Declaration's fate that the *Eco* next reported, "It is overwhelmingly probably that a draft Declaration will be finalized this evening. Or that it will not. This is the unanimous opinion of those privy to the deliberations now taking place."[466] But all was not yet lost.

Although the Working Group on the Declaration remained bogged by oratory and revision, other Conference committees proceeded to approve most of the numerous recommendations from the draft Action Plan. Several speakers emphasized that, unless positive action by nations, regional organizations, NGOs, and the UN proceeded, the value of the preparatory process and of the Conference itself would be nullified. Delegates eventually approved 109 Action Plan recommendations. They agreed to establish an International Referral Service for environmental information, and to initiate an international data registry on chemicals' effects on the environment. As a whole, the UNCHE accords agreed that there should be more study of environmental problems, and more monitoring of environmental problems. But it offered few effective and no enforceable agreements for engaging in clear environmental improvements.

Many components of the approved Action Plan remained vague, like its bland emphasis on the importance of environmental education without explanation for how or what it should include. An UNCHE observer from *Time* magazine reported that, "The astonishing thing about the official meetings was that almost all

[466] *Stockholm Conference Eco*, June 13, 1972, 1; *Stockholm Conference Eco*, June 14, 1972, 1; *Stockholm Conference Eco*, June 16, 1972, 1.

the recommendations on the agenda were approved, though often watered down."[467] Only the final eight of the 109 recommendations addressed "Development and Environment," and all expressed concern with minimizing the potential costs of environmental protection. While the intentions of those final recommendations were clearly conveyed, the means for how such protections or additional financing would occur remained unspecified. As a result, those nods toward LDCs—like the general proclamation that environmental issues not be used as a pretext to limit trade or the development of resources for export—sat oddly in the Action Plan rather than the Declaration. But in the "spirit of Stockholm," at least delegates found some consensus on the UNCHE's recommendations, even if nations like the United States, Great Britain, and Japan regularly registered formal reservations against compensation and additionality.[468]

The UNCHE plenary also continued to host a stream of speeches from all 114 delegations as well as specially invited guests and NGOs. But each day, fewer delegates attended its lengthy and breathy sessions. That is, until the second to last day of the UNCHE, when the only other head of state aside from Sweden's appeared in Stockholm. On June 14, the penultimate day of the Conference, with diminished hopes of producing a draft Declaration, India's Prime Minister, Indira Gandhi arrived to address the UNCHE plenary, which quickly filled to standing-room only capacity. Ms. Gandhi agreed to attend the UNCHE at Maurice Strong's imploring to speak on the human environment from India's perspective and on behalf of all

[467] Friedel Ungeheuer, "A Stockholm Notebook," *Time*, June 26, 1972, 40-43, here 40.
[468] Hans Kruse, "Subject Area V: Development and Environment," in *The Results from Stockholm* (Berlin: Erich Schmidt Verlag GmbH & Co., 1973), 256-260.

developing nations in the global South. Standing before the plenary, wrapped in a colorful sari, Gandhi calmly delivered a conference-defining speech that, in sharp contrast to Chinese bluster, struck a conciliatory tone between rich and poor, and development and environment.[469]

Indira Gandhi's speech often mirrored the environmental outlooks first championed by Brazil, yet she did so in elegant prose, full of compassion and personal observations. "We are gathered here under the aegis of the United Nations," Gandhi told the capacity crowd. "We are supposed to belong to the same family sharing common traits and impelled by the same basic desires, yet we inhabit a divided world." On the one hand, she said, "the rich look askance at our continuing poverty—on the other they warn us against their own [industrial] methods." The people of the developing world, she told the UNCHE, of course do not seek environmental degradation. Yet the leaders of LDCs "cannot for a moment forget the grim poverty of large numbers of people." She reminded the plenary that the original initiative for the UNCHE emerged four years earlier with wealth nations' sudden concern over the dangers of pollution. Yet, in a memorable query, Gandhi quietly asked, "Are not poverty and need the greatest polluters? … How can we speak to those who live in villages and in slums about keeping the oceans, the rivers, and the air clean when their own lives are contaminated at the source? Improving the environment for a better quality of life cannot be improved in conditions of poverty." She reminded the Conference that environmental problems in LDCs were not the side effects of excessive industrialization, but were produced by "the inadequacy of

[469] Claire Sterling, "Pollution Meeting Hails Gandhi Talk," *Washington Post*, June 15, 1972,

development." If the rich saw development as the cause of environmental destruction, the poor saw it as "one of the primary means of improving the environmental for living, of providing food, water, sanitation and shelter, of making the deserts green and the mountains habitable." In the name of justice, to truly make the world one, and for the sake of both human rights and environmental quality, Ms. Gandhi explained, development must proceed.[470]

Gandhi spoke directly to the insurgent issue of growth, with all its recent attention and concern. Like Maurice Strong and others, she agreed the concept needed reconsideration, but not renunciation. "The feeling is growing," she observed, "that we should re-order our priorities and move away from the single-dimensional model which has viewed growth from certain limited angles, which seems to have given a higher place to things rather than to persons and which has increased our wants rather than our enjoyment." Yet, for her and the people she spoke for, a computerized and technocratic invocation to end growth would not suffice, nor would reducing products and people to statistics. "Pollution is not a technical problem," she declared. "The fault lies not in science and technology as such but in the sense of values of the contemporary world which ignores the rights of others and is oblivious of the longer perspective." As in the Vedic scriptures from which she quoted, Gandhi affirmed that compassion both for people and the planet's life-giving systems must provide the guide forward.

A22.

[470] "Indira Gandhi, India: The Unfinished Revolution," *Bulletin of the Atomic Scientists*, September 1972, 35-38.

With one day remaining in the Conference and the fate of the UNCHE Declaration still unclear, Gandhi concluded her speech with a challenge and with hope. She asked, "Will the growing awareness of 'one earth' and 'one environment' guide us to the concept of 'one humanity?' Will there be a more equitable sharing of environmental costs and greater international interest in the accelerated progress of the less developed world? Or will it remain confined to a narrow concern, based on exclusive self-sufficiency?" The answers, she hoped, would rest on the shared realization that "Life is one and the world is one, and all these questions are interlinked." Dwelling on the past or assigning blame, she advised, served little purpose, "for none of us is blameless." Instead, what mattered most in Stockholm was reassuring the poor that environmental progress "will not work against their interest, but will bring an improvement in their lives." Gandhi reminded the delegates that the world had come to Stockholm, "not in the expectation that this Conference can achieve miracles or solve all the world's difficulties, but in the hope that the opinions of each nation will be kept in focus, that these problems will be viewed in perspective and each project devised as part of the whole." After ten days of parlance in Stockholm, Indira Gandhi's speech received the UNCHE's first standing ovation. And at the end of two years of a difficult Conference planning process, Gandhi's address elegantly captured the concerns and hopes of the world's majority, while inspiring conscientious compromise on behalf of both the global North and South to make the Conference a success.

That evening, the Working Group on the Declaration met in its final attempt to issue a new UNCHE Declaration before the Conference concluded the following

day. For Brazil, the Working Group and revision process for the Declaration had placed it in a curious position. In the years preceding the UNCHE, Brazil emerged as the LDC's leading and most vocal critic against the Conference and against international environmental standards. The concentrated campaign by Brazil's authoritarian leadership worked to ensure the sanctity of its economic development and to safeguard its cherished sovereignty, particularly for control over its vast Amazonian resources. Brazil's rhetoric in the UNCHE planning process earned its image of opposition to environmental efforts. Yet, the success of Brazil's foreign ministers in clarifying and communicating its arguments to fellow LDCs in the UNCHE Preparatory Committee was remarkably successful.

As a result Brazil's preparatory success, the draft documents to emerge before the UNCHE reflected most of Brazil's original demands. Indeed, the original draft Declaration and Action Plan so embodied Brazil's arguments as to instill significant international prestige on Brazil. As such, by the time the UNCHE began in Stockholm, Brazil developed an interest in securing successful passage of its primary arguments in those documents. Re-opening debate on the Declaration and the Chinese outflanking Brazil in terms of radicalism threatened to diminish Brazil's new stature. With a touch of irony, the U.S. State Department's Christian Herter recalled of Stockholm that, "because the [People's Republic of China], and to some extent Tanzania and Algeria, tended to preempt the traditional extremist LDC positions, Brazil found itself working very closely with the United States and other countries that had participated extensively in the preparations for the Conference." As a result, Herter reported how the Brazilian delegation worked "long, hard, and

effectively" to re-negotiate a draft Declaration on which all nations, including industrialized ones, could agree, while still securing Brazil's propositions on development. China and other LDCs might have hoped for totally new and radical Declaration for the UNCHE, but as Herter noted, "Rather than go along with efforts to change these documents, Brazil defended them stoutly."[471] Brazil worked to secure its arguments in the new draft, while also attempting to contain radical additions to the Declaration to ensure the its approval by wealthy nations like the United States.

Motivated by Indira Gandhi's stately address, the delegates in the Working Group on the Declaration pushed through a marathon session of debate that lasted fifteen hours through the night, and did not conclude until 5:00 am on the final day of the Conference. After much haranguing, the Working Group finally agreed upon a preamble and twenty-five principles in a new Declaration, which the assembled nations in the plenary could vote upon. None seemed happy with all of it. But quite literally, in the final hours, with the world watching under the international media's brief spotlight, the planet's first intergovernmental gathering on global environmental concerns did produce a Declaration on the Human Environment. The final document differed from the original Declaration, though not nearly as radical as some feared and others hoped. The original wording was not adopted, and the new Declaration included four additional principles.

[471] Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 325, Classified Report of the Vice-Chairman of the UN Conference on the Human Environment from Delegation (Herter) to Secretary of State Rogers, Washington, July 28, 1972.

Although the Working Group on the Declaration acquiesced to four new principles to bring the Declaration's sum to twenty-six, two original principles stood beyond agreement.

First, Brazil and Argentina remained at odds over a principle that could have established something similar to an international environmental impact statement, whereby one nation would notify others of development plans that might adversely impact the environment beyond its national boundaries. Brazil had initiated plans for what later became the massive Itaipú Dam on the Paraná River, near its boarder with Argentina.[472] The Argentine government feared the project would reduce the river's navigability, decline fish populations that travel upriver to spawn, and reduce essential water supplies to six major cities, including Buenos Aires. Argentina sought revised language requiring analysis and sharing of information about international environmental incursions, while Brazil firmly defended its sovereign right do as it wished with its own resources.[473]

At an impasse, the Working Group resolved to submit the draft of what eventually became Principle 21 to the UN General Assembly, which eventually sided with Brazil. The final language of Principle 21 declared "the sovereign right" of nations to exploit their own resources based on their own environmental policies, but also notes "the responsibility" of states not to damage the environment beyond their jurisdiction. The nonbinding principle became a key feature of nascent international environmental law, and its language on national rights by far outweighs

[472] José Costa Cavalcati, the Brazilian Minister of the Interior who delivered Brazil's development-focused plenary address at the UNCHE, later directed construction of the Itaipú Dam. See Guimarães, *The Ecopolitics of Development in the Third World*,

the mild encouragement for environmental responsibility. As such, the Working Group dispute, and Brazil's eventual victory, reflected the predominance of politics over environmental considerations within the Working Group and the UNCHE generally.[474]

The final point of disagreement as the UNCHE's closing ceremony drew near concerned nuclear weapons. In the Working Group, Japan sought to broaden Principle 26 from a bland condemnation against atomic weapons generally, to include any testing and use of nuclear weapons and all other weapons of mass destruction in all spheres. While the principle particularly addressed the world's nuclear powers, it was aimed especially at China and France, which still conducted atmospheric nuclear tests. After lengthy debate, all members of the Working Group—except China—agreed to limit Principle 26 in pithy but limp language stating, "Man and his environment must be spared the effects of nuclear and all other means of mass destruction." China had tried and failed to rework the text to awkwardly condemn nuclear weapons, while nonetheless defend its right to conduct nuclear tests, which it said was for the sole purpose of self-defense against the superpowers and to break their nuclear monopoly. China refused to approve even the bland otherwise agreed-upon text.

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[473] *Stockholm Conference Eco,* June 15, 1972, 1.

[474] United Nations, *Report of the United Nations Conference on the Human Environment held at Stockholm, 5-16 June 1972: Action Taken by the Conference,"* UN General Assembly document A/CONF.48/14 (July 3, 1972), Declaration on the Human Environment, Principle 21, pp 5; Roberto P. Guimarães, *The Ecopolitics of Development in the Third World: Politics and Environment in Brazil* (Boulder, CO: Lynne Rienner Publishers, Inc., 1991), 155-156; Nigel Hawkes, "Stockholm: Politicking, Confusion, but Some Agreements Reached," *Science* 176:4041 (June 23, 1972), 1308-1310.

China was the only nation not willing to consent to the strained compromises in the revised Declaration. True to their words from their plenary address, China thus threatened not to participate in voting for a Declaration on which all nations had not mutually consented. However, in the UNCHE's final ceremonies later that day, the Conference President avoided China's lone veto with a parliamentary maneuver to verbally adopt the Declaration via acclamation.[475] In his report to President Nixon on the UNCHE results, Russell Train noted how the Chinese were clearly "using the Conference to identify strongly with the 'Third World' and to establish their leadership in that regard. … [I]t is my view that they failed to win any new ground in this respect, and actually seemed to be losing ground at the end."[476] While China entered its first major UN convention with great fanfare and international attention, it left the UNCHE isolated.

In the end, the final Declaration on the Human Environment embodied Maurice Strong's hopes for "first steps" toward founding guidelines for future international environmental policy and law—what he called in his opening speech "a new and important—indeed, an indispensible—beginning attempt to articulate a code of international conduct for the age of environment." The process and final product of the Declaration clearly reflected the world's emerging North-South political dynamic and the eventual twilight of its once-dominant East-West axis. It

[475] Journal Editors, "The Stockholm Conference: A Synopsis and Analysis," *Stanford Journal of International Studies* 8 (Spring 1973): 31-78, here 35; Louis B. Sohn, "The Stockholm Declaration on the Human Environment," *The Harvard International Law Journal* 14:3 (Summer 1973), 508-507; Nigel Hawkes, "Stockholm: Politicking, Confusion, but Some Agreements Reached," *Science* 176:4041 (June 23, 1972), 1308-1310.

[476] Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 324, Memorandum From the Chairman of the Council on Environmental Quality (Train) to President Nixon, Washington, June 19, 1972: UN Conference on

also signaled a slow-growing realization that international law and policy should embrace not just states, but individuals and international organizations; and to do so, it must include appraisal of social issues and become an instrument of distributive justice.

Yet, according to the journal *Science*, the revised language of the final Declaration also "betrayed the enormous efforts that had to be made to achieve consensus." Louis B. Sohn, a leading authority on international law at Harvard, explained of the revised Declaration that, "the necessary compromises resulted in an inconsistency of formulas and the constant shifting from one approach to another."[477] The wide-ranging principles ran from human rights and nuclear disarmament to the need for environmental research and education. It included general beseeching against pollution, the need to safeguard wildlife and natural resources, and the importance of cooperating on international issues, as well as a puzzling admonition to "share" non-renewable resources. Some of the new additions lost sight of the environment entirely in favor of social protest. To South Africa's chagrin but to China's preference, the revised version included as its new first principle that, "policies promoting or perpetuating apartheid, racial segregation, discrimination, colonial and other forms of oppression and foreign domination stand condemned and must be eliminated."[478]

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the Human Environment.

[477] Louis B. Sohn, "The Stockholm Declaration on the Human Environment," *The Harvard International Law Journal* 14:3 (Summer 1973), 424-515, here 513.

[478] United Nations, *Report of the United Nations Conference on the Human Environment held at Stockholm, 5-16 June 1972: Action Taken by the Conference,"* UN General Assembly document A/CONF.48/14 (July 3, 1972), Declaration on the Human Environment, Principle 1, pp. 4.

Nonetheless, the Declaration's general tone still called for nations to recognize that their internal activities may have harmful impact on the environment of other nations and people, and that states must accept the responsibilities associated with this recognition. It laid clear claim for sovereign nations to determine and control their own policies on population and resource use. Its paramount points were that environmental protection need not—indeed, must not—impair economic development; that rational planning could resolve conflicts between development and environment; and that development, which was needed to improve the environment, required financial assistance. Like the Founex report, the Stockholm Declaration on the Human Environment expressed the need to synthesize development and environment, but to its detriment, neither gave any indication for how to do so. Vague intonations for "integrated development" or "rational planning" lacked substance and concreteness, as did much of the disjointed Action Plan. However, as Paul Lusaka, a delegate from Zambia, noted at the end of the Conference, "We have not achieved miracles but we must be realistic, and this Declaration surpasses all our earlier expectations."[479]

Assessing Winners and Losers: Brand New World or Business As Usual?

The plenary's acclimation in Stockholm of the final Declaration and Action Plan concluded the UN Conference on the Human Environment after four years of anticipation, after two years of actual preparation, and after two weeks of hard-fought debate. By the end of the Conference, most delegates—aside from the

[479] Paul Luaska quoted in "The Essence of Stockholm," *The Environment Monthly* (June 1972),

Chinese—sounded approval for the UNCHE's accomplishments. Peter Walker, head of the British delegation and England's Secretary of State for the Environment, described being "delighted with the results, and disappointed only that important detailed agreements have been overshadowed by political battles on non-environmental issues." Barbara Ward suggested, "We may be on the way to a new moral reality." The *New York Times* headline proclaimed, "Sense of Accomplishment Buoys Delegates Leaving Ecology Talks." Even Brazilian delegate Carlos Calero Rodrigues said, "Yes, we are satisfied with the results. We didn't expect too much, but we approve the recommendations—they are good."[480] But was the UNCHE a success? Was it a "landmark," a "milestone," a "pivotal event" for international environmental politics and diplomacy, as some political scientists claim?

Like many political scientists, both North and South could claim the UNCHE as a triumph. To the delight of LDCs, the UNCHE protected sovereign use of natural resources and evaded passage of international environmental conventions. The final documents of the UNCHE eschewed the environmental drama of non-governmental actors who advocated limits to growth and, instead, promoted LDC admonitions that development and additionality offered the primary solutions to their environmental problems. The final resolutions of the UNCHE reflected clear LDC successes. Yet, wealthy nations also left Stockholm similarly claiming the UNCHE as a success in

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1-3, here 3.

[480] Walker and Calero Rodrigues quoted in Nigel Hawkes, "Stockholm: Politicking, Confusion, but Some Agreements Reached," *Science* 176:4041 (June 23, 1972), 1309-1310; Ward quoted in R. Stephen Berry, "Only One World: An Awakening," *Bulletin of the Atomic Scientists*, September

bringing new awareness to environmental issues while the conference's non-binding resolutions still secured industrial nations' economic hegemony over global North-South relations. As such, the UNCHE was less a success in establishing a new international environmental order as it was in institutionalizing the status quo of existing geopolitical power dynamics into the processes of global environmental policymaking.

In the eyes of the LDCs, the immediate aftermath of the UNCHE appeared as a remarkable success for them. First under Brazilian leadership, and later with strong assists from China, India, and several African states, the LDCs entered the UNCHE emphasizing the priority of their development amid any international environmental considerations. LDCs also held strong desires to avoid global standards or conventions limiting either their national sovereignty or economic growth. The UNCHE process shined a bright light on LDC arguments for how nations should approach environmental problems and, in that context, encouraged industrialized nations to reconsider the moral implications of the wealth divergence between the global North and South. Upon the UNCHE's conclusion, one sympathetic observer noted, "it will be difficult for Western environmentalists ever again to view 'the environment' in a parochial way. The developing countries of the world offered the West a new, expanded perspective on environmental issues. The developing countries dominated [the UNCHE] … in practically all aspects."[481] In those regards, the UNCHE appeared as an LDC success.

1972, 17-20; Gladwin Hill, "Sense of Accomplishment Buoys Delegates Leaving Ecology Talks," *New York Times*, June 18, 1972, 14.

[481] Terri Aaronson, "World Priorities," *Environment* 14:6 (July/August 1972), 4-13, here 4.

Furthermore, the UNCHE, and the long planning process for Stockholm, served to unify LDC arguments toward revising the global economic order, with the accompanying contention that doing so provided the only means for resolving global environmental challenges. In light of the controversy in the industrialized world over the wisdom and sustainability of economic growth, the journal *Nature* reported in the wake of the UNCHE that,

> the conference has not served so much as a rallying point for those who espouse the new fad of zero economic growth but rather as a platform for those who insist that environmental problems are not soluble unless more resources are available, that there is in any case no necessary conflict between economic growth and careful management of the environment, and that, in any case, the most serious environmental indignities are not those of pollution, however international, but those of poverty, disease, and unjust government. … The truth is that if what advanced societies hanker after is a decent environment, they must first set out to create a decent world.[482]

Toward those ends, two years later, LDCs in the UN General Assembly formally appealed for fundamental changes to the world economic system with resolutions for establishing a New International Economic Order (NIEO) and outlining the UN *Charter of Economic Rights and Duties of States*. While those LDC economic stipulations went unheeded amid the economic dislocations of the mid-1970s, the UNCHE's unifying process in confronting global environmental issues through increased development provided important earlier opportunities in clarifying and promoting the economic and environmental imperatives of LDCs demands.[483]

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[482] "Mr. Strong's Recipe," *Nature* 237 (June 23, 1972), 418-419.

[483] UN General Assembly resolution 3201 (S-VI, Sixth Special Session) "Declaration on the Establishment of a New International Economic Order," May 1, 1974; UN General Assembly resolution 3202 (S-VI, Sixth Special Session) "Programme of Action on the Establishment of a New International Economic Order," May 1, 1974; UN General Assembly resolution 3281 (XXIX) "Charter of Economic Rights and Duties of States," December 12, 1974. See also, Nico Schrijver,

During the preparatory process for the UNCHE, not only did LDCs insure that their demands on the primacy of development and the terms of additional financing were embedded within the Conference's draft documents, but at the actual Conference, LDCs successfully bolstered their arguments—especially on additionality—through the revised Declaration and the accompanying Action Plan. For instance, Principle 6 of the revised Declaration emerged anew from the Working Group to call for "the transfer of substantial quantities of financial and technological assistance." A revised Principle 10 stated LDC's need for "stability of prices and adequate earnings for primary commodities and raw materials."[484] These principles—which reflected specific changes made to the draft Declaration—and other explicit requisitions in the approved UNCHE documents, infer an obligation for the wealthy and industrialized nations to expedite the economic development of LDCs as part of any international environmental imperative. Although it would be naïve to overemphasize these LDC accomplishments as decidedly altering the allocation of power in the North-South political dynamic, the LDCs could rightfully consider these results from their participation in the UNCHE process a success.

If LDCs considered the UNCHE a success, a zero-sum view of the Conference would thus presume industrial superpowers like the United States would consider the UNCHE a failure. Not so. The reports on the Conference by lead American delegates and advisors all identified the UNCHE as more than favorable to

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Sovereignty Over Natural Resources: Balancing Rights and Duties (Cambridge, UK: Cambridge University Press, 1997), 82-83.

[484] United Nations, *Report of the United Nations Conference on the Human Environment held at Stockholm, 5-16 June 1972: Action Taken by the Conference,"* UN General Assembly document A/CONF.48/14 (July 3, 1972), Declaration on the Human Environment, Principles 6, 10, 12, pp. 4.

the United States. With regard to the final Declaration, a State Department summary explained that, "The final text, although uneven in the view of the United States Delegation, preserves a number of extremely important principles of conduct for states in dealing with environmental problems of international significance."[485] Moreover, Christian Herter told U.S. Secretary of State Rogers that, "On the whole, the Conference was a considerable success in terms of U.S. interests." Russell Train's report to President Nixon gushed, "It is my personal assessment that the Conference was a success. The United States played a strong role and gained practically all of its objectives. We consistently opposed 'politicizing' of the Conference with war and similar issues, and had good success, given the makeup of the Conference."[486] For America's two lead delegates in Stockholm, the UNCHE successfully secured its superpower objectives while also provoking widespread international awareness and participation in addressing global environmental issues—regardless of the Soviet boycott.[487]

[485] Report of the Office of Environmental Affairs, Bureau of International Scientific and Technological Affairs, "UN Conference on the Human Environment: Round-Up of Actions Taken," June 21, 1972, Folder Stockholm Initiatives [from OA10023] [1 of 3], Box 106, Subject File, John C. Whitaker, Staff Member and Office Files, White House Central Files, Nixon Presidential Materials, National Archives at College Park, College Park, MD (viewed prior to their transfer to the Richard Nixon Presidential Library and Museum in Yorba Linda, CA).

[486] Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 325, Classified Report of the Vice-Chairman of the UN Conference on the Human Environment from Delegation (Herter) to Secretary of State Rogers, Washington, July 28, 1972; Foreign Relations of the United States, 1969–1976, Volume E–1, Documents on Global Issues, 1969–1972, Document 324, Memorandum From the Chairman of the Council on Environmental Quality (Train) to President Nixon, Washington, June 19, 1972: UN Conference on the Human Environment.

[487] Herter's report to Secretary of State Rogers noted, "The USSR did not attend, nor any of the Eastern Bloc except Rumania and Yugoslavia. No one seemed to care." Likewise, Train's note to Nixon stated, "The absence of Soviet Russia and the Eastern bloc countries was noted at the outset and thereafter went practically unremarked. Soviet non-participation had little effect on the Conference work."

Similarly, Nixon's domestic advisor on natural resources and the environment, John C. Whitaker, told the President that, "Despite the efforts of a number of demonstrators both those representing particular countries and private groups, the UN Conference on the Human Environment … was in my opinion successful from our point of view." Like Train, Whitaker explained that, "The attempts to gain headlines by embarrassing the United Stated delegation with charges of 'ecocide' in Vietnam and militant disarmament requests by some of the peripheral attending nations tended to overshadow the following concrete accomplishments which I believe will long outlive the demonstrators."[488] Russell Train's summary to President Nixon further highlighted the U.S. delegation's success in solidifying its economic position in the international environmental realm, despite LDCs deeply embedding additionality in the revised Declaration and other UNCHE documents. Train reported that the American delegation "consistently opposed using the Conference as an excuse for new development 'add-ons.'" However, he continued, "it is evident that it is not possible to discuss environmental protection with the LDCs completely outside the context of development objectives." The United States, which was heavily involved in the UNCHE planning process from the start, clearly considered its interests served by the Conference's final results—even with the UNCHE's ultimate melding of development into environmental matters.

[488] John C. Whitaker, Memorandum for President Richard Nixon, June 23, 1972, Folder [United Nations] Stockholm Conference on the Human Environ., Council on Environmental Quality [from CFOA249], Box 106, Subject File, John C. Whitaker, Staff Member and Office Files, White House Central Files, Nixon Presidential Materials, National Archives at College Park, College Park, MD

Although LDCs made clear commands, the United States considered the UNCHE results a triumph because the UN's nonbinding obligations carried little weight with regard to actual assets and financing, especially when so many industrial nations like the United States included reservations and limiting interpretive statements with the UNCHE Declaration.[489] For instance, the additionality request in the revised Declaration's Principle 12—which called for additional financial aid to LDCs to integrate environmental safeguards into their development planning—included an official interpretation that "the U.S. does not regard the text of this principle, or any other language contained in the Declaration, as requiring it to change its aid policies or increase the amounts thereof."[490] In short, the United States need not pay a penny more to LDCs, for their increased development nor to safeguard the environment. The UNCHE may have promoted environmental awareness and projected a successful image of international efforts toward resolving the global environmental crisis, but it merely secured the status quo.

With vocal constituents in industrialized nations questioning economic growth as a means to combat environmental harm, and with LDCs clamoring for additionality to better integrate development with environment, the UNCHE accomplishments absorbed both. As Lee-Anne Broadhead argued, "This is not to say

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(viewed prior to their transfer to the Richard Nixon Presidential Library and Museum in Yorba Linda, CA.)

[489] Hans Kruse, "Subject Area V: Development and Environment," in *The Results from Stockholm* (Berlin: Erich Schmidt Verlag GmbH & Co., 1973), 256-260.

[490] Report of the Office of Environmental Affairs, Bureau of International Scientific and Technological Affairs, "UN Conference on the Human Environment: Round-Up of Actions Taken," June 21, 1972, Folder Stockholm Initiatives [from OA10023] [1 of 3], Box 106, Subject File, John C. Whitaker, Staff Member and Office Files, White House Central Files, Nixon Presidential Materials, National Archives at College Park, College Park, MD (viewed prior to their transfer to the Richard Nixon Presidential Library and Museum in Yorba Linda, CA).

that those individuals gathered together at the official conference in Stockholm were not sincere in their desire to improve the state of the world's environment. … [However,] through acceptance of the status quo, thinking about solutions is inevitably limited to tinkering rather than any kind of fundamental reevaluation."[491] For the United States and other industrial nations, the UNCHE successfully institutionalized international environmental requirements in the UN's global structure, with its fierce defense of national sovereignty, and with its entirely unenforceable agreements. The international environmental avenues pursued through the UN required neither a no-growth approach nor efforts to re-order global wealth inequalities. No wonder delegates from industrial nations like the United States were satisfied. The UNCHE, with its non-binding declarations and suggestions for action, amounted to a world-scale public relations coup for the industrialized nations.

To be fair, the UNCHE was successful toward the original aim of its earliest ECOSOC charge in 1968 to "create a basis for comprehensive consideration within the United Nations of the problems of the human environment."[492] The UNCHE did, after all, permanently place consideration of the environment as a whole on the UN agenda through its creation of UNEP. A common claim to LDC success in establishing the nascent international environmental regime on their own terms was securing UNEP's headquarters in Nairobi, Kenya—the first major UN body located in the global South. However, because of UNEP's small size, insufficient funding, and its peripheral position in Nairobi, it has failed to have significant effectiveness in

[491] Lee-Anne Broadhead, *International Environmental Politics: The Limits of Green Diplomacy* (Boulder, CO: Lynne Rienner Publishers Inc., 2002), 39.

combating international environmental challenges. From the start, UNEP was institutionally weak and removed from the centers of influence within the UN. Additionally, the UNCHE saddled UNEP with an impossibly broad remit, a vague list of priorities, and little funding to accomplish its aims. Money for UNEP came from the voluntary Environment Fund—a key feature for the U.S. delegation in Stockholm—but the fund's meager and voluntary contributions fell far short of its targets. UNEP has been unable to accomplish much toward rectifying or preventing significant international environmental problems other than monitoring their continuation.[493]

In 1968, the ECOSOC's original vision for the UNCHE also aimed to "focus the attention of governments and public opinion in various countries on the importance of the [environmental] problem." If environmental awareness was not on the radar of nations before the UNCHE, recognition of environmental challenges in systematic and comprehensive terms did gain significant global recognition leading up to, during, and even after the Conference. Claire Sterling admitted after the UNCHE that, "Consciousness of environmental matters had undoubtedly been heightened. At least some of the talk here seems bound to rub off on governments sooner or later." Indeed, in the wake of the UNCHE, many nations followed the lead of the UN and other advanced industrial nations to institutionalize environmental

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[492] UN Economic and Social Council, Annexes, Agenda 12, UN ECOSOC document E/4466/Add.1, p.2, New York, 1968.

[493] Maria Ivanova, "Moving Forward by Looking Back: Learning from UNEP's History" in *Global Environmental Governance: Perspectives on the Current Debate,* edited by Lydia Swart and Estelle Perry (New York: Center for UN Reform Education, 2007), 26-47; W. M. Adams, *Green Development: Environment and Sustainability in a Developing World*, 3rd Edition (New York: Routledge, 2009), 63-64.

issues with new national environmental ministries or agencies. Despite Brazil's strong initial resistance to environmental organizations, in 1973, it established the Special Secretariat for the Environment (*Secretaria Especial do Meio Ambiente*, or SEMA), Brazil's first national environmental institution. Brazilian scholars agree that SEMA was Brazil's response to Principle 17 of the UNCHE Declaration, which stated that "Appropriate national institutions must be entrusted with the task of planning, managing, or controlling the environmental resources of the states with the view to enhancing environmental quality."[494]

Even China, upon returning from its humbling experience in Stockholm, established in 1973 the country's first official environmental protection organization, called the Leading Group on Environmental Protection in the State Council, as well as its first "Ten-Year Program for Environmental Protection." Similar to the eventual environmental dynamics with the UN, China's environmental measures earned little oversight and very limited funding, leading to their failure.[495] Other nations, especially in Africa, failed to take any environmental action after the UNCHE. Nigeria, for instance, did not establish a Ministry for Environment until June 1999, more than a quarter century after the UNCHE. Adebayo Adedeji, who led the Nigerian delegation to the UNCHE, later recalled "There is no doubt that in Nigeria we could have done more to internalize all the major decisions of the conference.

[494] Lilian Cristina B. Duarte, "Green Institutions in Brazil: The Road from Stockholm to Rio" (Ph.D. diss., American University, 1998), 87; Roberto P. Guimarães, *The Ecopolitics of Development in the Third World: Politics and Environment in Brazil* (Boulder, CO: Lynne Rienner Publishers, Inc., 1991), 159-163. Lillian Duarte wrote that "All students of environmental policies in Brazil mention the Special Secretariat for Environment as an example of international influence in the creation of an institution."

Unfortunately, the UN had no mechanisms for follow-up on conference decisions. … [Stockholm] provided the basis for action but unfortunately not the resources to take such actions."[496] In both China and Nigeria, as with the intergovernmental UNEP, failure stemmed from weak commitment and lack of funding.

Perhaps the UNCHE was not quite the success so many participants and scholars believed—particularly in light of the extremely limited commitments and interpretive reservations by wealthy nations to the development of LDCs. When assessing the final results of from Conference, the Italian-based *Washington Post* reporter Claire Sterling offered the clear-eyed view that, "Any suggestion that the wealthier states mean to carry out all the recommendations here would strain the credulity." Naming the UNCHE documents "a lengthy roll of diplomatic wallpaper," she observed that, "Should the recommendations indeed be respected, they would involve a massive transfer of resources beyond the wildest dreams of [the LDCs]." However, since none of the UNCHE recommendations included a binding signature nor real money, "what they boil down to is an appeal to the poor countries to behave with more environmental virtue while trying to get richer, and to pay for the virtue themselves." With regard to the LDCs in Stockholm, Sterling concluded that, "Having asked for absolutely everything, they got it, on paper. They might have ended up with at least a little more in real terms if they had asked for less."[497] These

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[495] Bao Maohong, "The Evolution of Environmental Problems and Environmental Policy in China: The Interaction of Internal and External Forces," in *Environmental Histories of the Cold War* (New York: Cambridge University Press, 2010), 323-340, here 334-335.

[496] Interview of Adebayo Adedeji by Thomas G. Weiss (March 6-7, 2001), *United Nations Intellectual History Project: The Complete Oral History Transcripts from* UN Voices. CD-ROM, 2007.

[497] Clair Sterling, "U.N. Environment Conference: A Happening," *Washington Post*, June 17, 1972, A13.

observations beg the question whether the UNCHE could ever have been a real success for LDCs. Given a UN so predicated on securing national sovereignty and so devoted to development that it could neither recognize the fundamental relationship of traditional economic expansion to global environmental degradation, nor alter international structures to combat such degradation—how could the UNCHE have achieved real success in saving Spaceship Earth?

In short, the LDCs in Stockholm failed to grasp the realistic political and economic limits of the UNCHE, despite having worked so hard during the preparatory process to establish those limits. LDCs were likewise unable in Stockholm to sense how far industrialized nations might reasonably follow LDCs' appeals toward additionality for environmental improvement. Ironically, the LDCs' success in foreclosing binding commitments on planetary environmental standards during the UNCHE planning process also foreclosed the possibility of progressive funding to combat global environmental hazards, and made impossible any opportunity that the UNCHE might re-order the international structures that perpetuate such hazards. Tony Brenton, a career British diplomat on international environmental issues recalled of UNCHE results that, "it is difficult to argue that they have had more than a marginal effect on the subsequent history of international environmental action." The lengthy UNCHE documents may have catalogued several existing international environmental concerns and activities, but they "failed to redirect them or propel them in any significant way."[498] In those regards, both the

[498] Tony Brenton, *The Greening of Machiavelli: The Evolution of International Environmental Politics* (London: Earthscan Publications Ltd and the Royal Institute of International Affairs, 1994), 49.

preparatory process for the UNCHE and its spate of activity in Stockholm signaled both the cresting and culmination of the global environmental moment.

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Thirty years after the UNCHE in Stockholm, Maurice Strong assessed its legacies. Strong admitted that "The Stockholm Conference starkly brought out the differences between the positions of developing and more industrialized countries, but did not resolve them."[499] He would know. The UNCHE remained vague on operational details and virtually no action was taken on its Declaration and Action Plan for two decades. In 1992, twenty years after the 1972 UNCHE in Stockholm, the UN decided to hold another intergovernmental conference on the global environment. That year, Brazil hosted the UN Conference on Environment and Development—the Rio Earth Summit—which Strong also organized as that conference's Secretary-General. Yet many of the same problems from the UNCHE also infected Rio.

Looking back on the dawn of global environmental diplomacy in the early 1970s, Strong acknowledged the inability then in Stockholm, later at Rio, and afterward to move beyond issues of additionally or to think anew on resolving global environmental problems. Since the first institutionalization of environmental matters at Stockholm, Strong admitted "the issues of finance and the basis for sharing responsibility and costs continue to be the principal source of differences and controversy between developing and more developed countries and have become

[499] Maurice Strong, "Stockholm Plus 30, Rio Plus 10: Creating a New Paradigm of Global Governance," in James Gustave Speth, ed., *Worlds Apart: Globalization and the Environment* (Washington, DC: Island Press, 2003), 33-50, here 36-37.

central to international negotiations on virtually every environment and sustainable development subject, most notable in the climate change and biodiversity conventions."[500] That is to say, the failures of Stockholm still continue to plague today's progress on solving global environmental problems.

In the early 1970s, Brazil's demand for development in environment eventually allowed for global participation at Stockholm. And the LDCs' insertion of development into environmental discourse within the UN helped lay the intellectual framework for what evolved as the concept of sustainable development. However, opening this conceptual door closed others. At least within the structures of the UN, these developments helped end the global environmental moment as a time for nation states to institute radical transformation away from traditional paths of modernization. In exchange for global participation of LDCs in Stockholm, the UNCHE simply transformed environmental problems into development issues and further grounded the UN as another vehicle legitimizing rapid industrial growth. Thus, solutions to global environmental problems within the UN were significantly narrowed to revolve henceforth almost entirely in terms of more money, more technology, and more management. Contrary to the historical myopia of some global environmental scholars, this process of environmental institutionalization in the UN had its origins in the 1972 UNCHE.[501]

[500] Maurice Strong, "Stockholm Plus 30, Rio Plus 10: Creating a New Paradigm of Global Governance," in James Gustave Speth, ed., *Worlds Apart: Globalization and the Environment* (Washington, DC: Island Press, 2003), 33-50, here 36-37.

[501] Park, et al, make a related argument, but an insufficiently historical one, as they begin their analysis with the 1992 Rio Earth Summit, the UN Conference on Environment and Development. They fail to sufficiently explore and extend back the important origins of this institutionalization during the UNCHE planning process and the actual events at Stockholm in 1972. See, Jacob Park, Mattias Finger, and Ken Conca, "The Death of Rio Environmentalism," *The Crisis of Global*

Because of the LDC counter-assault during the UNCHE planning process, the UN's Stockholm conference was unable to sufficiently deal with the socio-cultural, economic, or political problems that lay at the heart of global environmental problems. Instead, the UN remained superficial and limited to transboundary environmental issues like preservation of world heritage sites and monitoring ongoing environmental decline. It would not confront the more prevalent and socially challenging issues of environmental degradation that occur inside sovereign territories or that stem from global systems of economic inequality, which often result from typical methods of economic growth and development. As a result, the UNCHE enabled some progress toward nature protection and spurred global awareness of environmental challenges, but it did little to resolve the main problems at the root of global environmental problems: the social systems of development that reinforce inequality and re-produce patterns of ecological degradation.

However, during the global environmental moment and throughout Stockholm's environmental circus, the voices of governments within the UN were not the only actors addressing environmental challenges. Ironically, Brazil and other LDCs' success in institutionalizing global environmental matters within the UN—which inherently enshrined national sovereignty for resource exploitation and promoted economic growth and development as the primary solution for global environmental problems—actually encouraged increased participation at Stockholm by nongovernmental actors who sought different solutions. Nongovernmental actors—like the pacifist Fellowship of Reconciliation and its transnational peace

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Environmental Governance: Towards a New Political Economy of Sustainability, edited by Jacob

effort called Dai Dong, or the newly formed Friends of the Earth, or the Scientists Institute for Public Information, among others—strove to make their voices heard before the UNCHE and during it while expressing very different solutions to global environmental problems than those promulgated by national governments within the UN.

As addressed in the final two chapters, these non-state actors saw the excitement surrounding the UN's environmental conference in Stockholm as an opportunity to capture world attention, to make their unique views heard, and to possibly influence the debate within the UN meeting to something beyond the status quo. To better understand the broader impact of the global environmental moment and how it climaxed in Stockholm, Chapters 7 and 8 step back in time to explore how alternative voices formulated and sought to express their views on the global environment, both before the UNCHE and during it. Eventually, in the outer rings and as part of Stockholm's environmental circus, many nongovernmental activists held separate environmental conferences or attended the NGO Environment Forum in Stockholm during the official UNCHE proceedings. In Stockholm's outer rings, these actors expressed their own creative solutions to global environmental challenges outside the international regimes of sovereign nation states.

Park, Mattias Finger, and Ken Conca (New York: Routledge, 2008).

Chapter 7

GLOBAL POTENTIAL, TRANSNATIONAL LIMITS: The Triumphs and Tragedy of Dai Dong

"the [scientists] of this world...have examined the parts and missed the whole, and their blindness is even worthy of wonder."
— Fyodor Dostoevsky, *The Brothers Karamazov*, 1880

"[Dai Dong's] function will be to help people all over the world understand…that only by transcending barriers of language and race, class and national interests, and by reconciling differences of religion and ideology, can we make the effort to save the earth for ourselves and future generations."
— Dai Dong (The Community of Man), *promotional material*, 1971

The environmental circus in Stockholm included many more actors than those confined to its inner ring at the United Nations Conference on the Human Environment (UNCHE). At Stockholm in the summer of 1972, the outer rings of events included organizations and individuals who saw efforts of the UNCHE as woefully limited by, among other things, the artificial yet rigid boundaries of national sovereignty and national self-interest, as well as the UN's refusal to seriously reconsider the environmental consequences of economic growth and development. Due in part to the success of the UN's less developed countries to restrict reappraisals of sovereignty or the priority of economic growth during the UNCHE, non-governmental organizations and individuals developed their own solutions for saving Spaceship Earth and promulgated them both before and during the environmental circus in Stockholm.

In order to expand our view of the global environmental moment as it moved toward culminating events in Stockholm, this chapter initially steps back in time to

the late 1960s to analyze the formation and efforts of a unique non-governmental organization named Dai Dong. Dai Dong was a brief but influential pacifist fellowship with environmental interests that rose and fell during the global environmental moment, mostly in relation to the planning and performance of the UNCHE. Dai Dong ultimately organized its own Independent Conference on the Environment as one of the outer rings in Stockholm's environmental circus in 1972. A focus on Dai Dong thus broadens our understanding of the dawn of global environmentalism beyond the inner ring of nation-state politics that dominated the UNCHE. Both before and during Stockholm, Dai Dong promoted a transnational and systems-based political approach to global environmentalism. The rapid rise and fall of Dai Dong, however, reveals the limits of such an explicitly transnational environmentalism.

Dai Dong was founded in 1969 by an American pacifist named Alfred Hassler, who directed Dai Dong until early 1974 under the sponsorship of the Fellowship of Reconciliation, Dai Dong's parent international pacifist institution. The name Dai Dong derived from the Chinese phrase *Dai Dong Thé Gioi*, which translates as "world of the great togetherness." Hassler selected this pre-Confucian concept of all Earth's people as a unified, interdependent family to reflect Dai Dong's ideology of global integration and its worldly aspirations beyond the interests of the global North.[502] In 1969, for instance, Hassler told the War Resisters International Conference that, "I am a North American by accident; by choice I am a

[502] Alfred Hassler, "The Order of Humanity–Dai Dong," compilation 1963-1970, Box 1, Origins, in the Fellowship of Reconciliation Records DG 013, Swarthmore College Peace Collection, Swarthmore, PA (hereafter, SCPC).

citizen of the world. My loyalty is not primarily to the United States of America, but to that world community."[503]

When Alfred Hassler died in 1991, *The New York Times* honored his lifelong pacifism and, for his direction of Dai Dong, celebrated Hassler as "a pioneer in the environmental movement."[504] Hassler's world-peace work with Dai Dong made him a pioneer of global environmentalism during the global environmental moment. Dai Dong promoted widely Hassler's socio-ecological conviction that "the great problems humanity faces—war, overpopulation, exploitation, environmental destruction—are interrelated, global in nature and demand global solutions."[505] Dai Dong thus expressed Hassler's conviction in the late 1960s and early 1970s that only an interdependent peace fellowship that looked beyond national divisions and embodied Earth's interdependent systems could find solutions for the world's dire and interconnected challenges. In the global environmental moment, Dai Dong dramatized the need for a worldwide fellowship—one not tied to single nation state—to find global solutions for saving Spaceship Earth.

Hassler's ideology and activism through Dai Dong integrates several aspects of the global environmental moment. Through Dai Dong, Hassler leveraged the knowledge and authority of environmental scientists and systems thinkers in attempts to synthesize ecosystem ecology not with development, as sought through the United Nations, but with the prerogatives of social justice. Dai Dong thus became a knowledge broker of environmental science and ethics, which launched its

[503] Alfred Hassler, "The End of the Age of Separatism," August 28, 1969, Box 1, Origins, SCPC.
[504] Marvine Howe, "Alfred Hassler, Lifelong Pacifist and Environmentalist, Dies at 81," *New York Times*, June 9, 1991.

meteoric rise in global environmental politics alongside but separate from the growth of global environmental awareness from the UNCHE planning process. Nonetheless, Hassler's greatest successes and widespread international attention for Dai Dong came from a contested relationship with the preparations for the UNCHE. Between 1970 and 1971, Dai Dong's creation and distribution of the Menton Statement, with support from thousands of the worlds' scientists, influenced UN policy-makers like U Thant and Maurice Strong to include greater scientific expertise in the UNCHE preparations.[506] Hassler, however, remained unsatisfied.

In the 1970s, many environmental scholars and global activists like Hassler believed the ecological health of the planet and the survival of human civilization on Spaceship Earth demanded an end to geopolitics based on national sovereignty.[507] Hassler thus reacted to the UNCHE's unrepentant support of national sovereignty, its emphasis on environmentally damaging economic development, as well as its silence on the issue of overpopulation by inviting thirty environmental scientists and scholars, many from the global South, to Dai Dong's own Independent Conference on the Environment, held alongside the UNCHE at Stockholm in 1972. Dai Dong's diagnosis of global environmental challenges captured international headlines and

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[505] Fellowship of Reconciliation pamphlet, n.d. (~1970), Box 2, Publications, SCPC.

[506] "A Message to Our 3.5 Billion Neighbors On Planet Earth," *The UNESCO Courier* (July 1971); U Thant, "Secretary-General's Response to Environmental Scientists," May 11, 1971, Folder 32, Box 2, Archival Series S-0885, United Nations Archives and Records Management Section (hereafter UNARMS), accessed February 27, 2011, http://archives-trim.un.org/webdrawer/rec/422866/.

[507] For example, Richard Falk, *This Endangered Planet: Prospects and Proposals for Human Survival* (New York: Vintage Books, 1971); William Ophals, *Ecology and the Politics of Scarcity* (San Francisco: W.H. Freeman, 1977). For more recent variations, see John McCormick, "International Nongovernmental Organizations: Prospects for a Global Environmental Movement," and Lettie Wenner, "Transboundary Problems in International Law," in *Environmental Politics in the*

earned an invitation to read its independent declaration before the UNCHE's plenary meeting.

However, Dai Dong's attempt to apply its countercultural systems approach to the complexities of international environmental politics ultimately proved unsustainable. Ironically, especially for an organization like Dai Dong that self-identified as transnational, many of the same political conflicts between nations of the global North and South within the UN ultimately played out within Dai Dong at Stockholm. Hassler's prescriptive emphasis on transnationalism and his preoccupation with overpopulation nearly tore Dai Dong's conference apart. Consequently, and despite its initial successes, Dai Dong financially collapsed early in 1974. Hassler's orthodoxy toward transnationalism reflects how many global activists first confronted the apparently intractable conflict between new transboundary threats to the environment and the deeply embedded systems of national sovereignty. To paraphrase Mark Twain, however, reports on the death of the nation state and its systems of sovereignty were greatly exaggerated. The ultimate failure of Hassler's dogmatic transnationalism and Dai Dong's eventual collapse reveals how global environmental activism and sovereign authority need not exist in total opposition.

As this chapter ultimately shows, other international environmental organizations like Friends of the Earth attenuated some of Dai Dong's approach and have since become an important component of today's system of international environmental politics. The success of international environmental organizations like

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International Arena: Movements, Parties, Organizations, and Policy, edited by Sheldon Kamieniecki

Friends of the Earth, which formed around the same time as Dai Dong, suggests that contemporary environmental actors work not against existent global systems—environmental or political—but through or around them. It was a lesson Alfred Hassler never learned. Some pioneers, after all, aim to leave a better world by leveling the forest and reshaping the landscape. Alfred Hassler's direction of Dai Dong thus reflects important elements of the global environmental moment and exemplifies the diverse activities at Stockholm's environmental circus. Hassler pioneered and widely promoted important messages about our interdependent global environment. His particular methods, however, reveal both the triumphs and tragedies of Dai Dong.

From World Peace and World Systems to World Environment

Alfred Hassler dreamed big and nurtured non-violent networks to reach for utopia. Born in Allentown, Pennsylvania in 1910, Hassler came of age in New York City, where he took night classes in journalism at Columbia University. In 1942, after imprisonment as a conscientious objector during World War II, Hassler became editor of *Fellowship*, a journal for the United States' Fellowship of Reconciliation (FOR-USA). The FOR, founded by European Protestants in 1914, had since grown into a worldwide Christian association of radical pacifists. Hassler's direction of publications for FOR-USA placed him amid the center of non-violent activism, both in the United States and abroad. In 1958, Hassler published a comic book publicizing Martin Luther King and the Montgomery bus boycott that remains FOR-USA's

(Albany, NY: SUNY Press, 1993), 131-144 and 165-178.

bestseller. Later that year, Hassler, who closely read developments in science as well as disarmament, sailed to Europe and the Soviet Union aboard Albert Bigelow's yacht, *Golden Rule*, to protest nuclear testing and raise awareness of global fallout. In the mid-1960s, Hassler's visits to Vietnam helped establish the International Committee of Conscience on Vietnam, which, among other endeavors, orchestrated an international tour of Buddhist monks who spoke against the Vietnam War. And in 1969, with support of international pacifist colleagues, including the Vietnamese Buddhist monk and anti-war activist, Thich Nhat Hahn, Alfred Hassler founded Dai Dong, a self-described "transnational peace effort" that sought to link war and other worldwide problems with the world environment.[508]

Dai Dong realized Hassler's long-held ambition, which he first announced back in 1963, for a trans-religious and transnational fellowship directed at individuals, not nations, to express how one person's distinctive existence related to the whole human community. In 1969, Hassler would use his new positions as General Secretary of the International Fellowship of Reconciliation (IFOR) and Executive Secretary of the FOR-USA to secure limited funding for what he originally called the Order of Humanity. At a planning meeting with Hassler in France, the Vietnamese Buddhist monk Thich Nhat Hanh recommended a different name for the new organization. Nhat Hahn suggested the Order of Humanity take on

[508] Paul Dekar, *Creating the Beloved Community: A Journey with the Fellowship of Reconciliation* (Telford, PA: Cascadia Publishing House, 2005), 116, 129-144; Clayborne Carson, senior editor, *The Papers of Martin Luther King, Vol. IV: Symbol of the Movement, January 1957-December 1958* (Berkeley: University of California Press, 2000), 302, 551; "Hassler, Alfred (1910-1991)," Martin Luther King, Jr. and the Global Freedom Struggle, accessed August 19, 2013, http://mlk-kpp01.stanford.edu/index.php/encyclopedia/encyclopedia/enc_hassler_alfred_1910_1991/; Quán Nhu, "Nhat Hanh's Peace Activities," reprinted on the Giao Diem website, accessed August 19, 2013, http://www.giaodiemonline.com/thuvien/FotoNews/nh_quannhu.htm.

the Chinese-inspired name Dai Dong—based on *Dai Dong Thé Gioi* or the "world of the great togetherness"—for a more global and less Western allure. Hassler agreed, in part because he liked how such global "togetherness" loosely reflected a social and ethical extension of the systems thinking embodied in the symbol of Spaceship Earth.[509]

Hassler, like other environmental and socially concerned thinkers in the 1960s, understood global challenges in terms of interconnected systems and through the rhetoric of holism. Hassler read closely and highlighted scientific and popular articles on systems analysis and cybernetic thinking.[510] A social application of the systems approach, Hassler concluded, could help identify the root causes of complex social problems and point toward their solution. Hassler thus adapted systems thinking into Dai Dong's holistic approach to world peace. This general and more philosophical lens of systems thinking, as Hassler saw it, envisioned nearly all aspects of the world interacting as a dynamic and interdependent system—and, importantly, one capable of being managed for improvement. The North American and European counterculture applied similar notions when rejecting systems of cultural oppression and calling for new, holistic modes of human interaction and organization. And because of the popularity of systems approaches in various scientific field throughout the 1960s, as addressed in Chapter 1, the philosophical systems approach adopted by Dai Dong loosely identified with and even drew upon

[509] Alfred Hassler, "The Order of Humanity–Dai Dong," compilation 1963-1970, Box 1, Origins, SCPC.

[510] See Hassler's highlights on Alice Mary Hilton, "Cybercultural Revolution," *The Minority of One* (October 1963), 11-14, Box 1, Origins, SCPC.

the legitimacy of modern science to justify its own visions of globally integrated harmony.[511]

Although Hassler followed scientific developments of the systems approach, he may have adapted the idea of applying systems thinking to social problems from his pacifist colleague, Dr. Martin Luther King, Jr. In 1964, at age thirty-five, King became then the youngest recipient of the Nobel Peace Prize and used his Nobel lecture to explain humanity's most pressing problems, as well as offer solutions in a global systems framework. Just after Hassler began exploring his idea for a transnational Order of Humanity, King called for a "worldwide fellowship," grounded in nonviolent activism that "lifts neighborly concern beyond one's tribe, race, class, and nation." Counterbalancing the world from "drifting rapidly to its doom," King noted something new and profoundly meaningful had begun: "Old systems of exploitation and oppression are passing away, … [and] new systems of justice and equality are being born." In celebrating the end of colonialism, King even expressed an inchoate combination of ecological and economic consciousness, noting how "The earth is being redistributed."[512] In the eyes of Martin Luther King, Jr., the whole world, and all the people in it, functioned as an integrated system.

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[511] Linda Sargent Wood, *A More Perfect Union: Holistic Worldviews and the Transformation of American Culture after World War II* (New York: Oxford University Press, 2010); Debora Hammond, *The Science of Synthesis: Exploring the Social Implications of General Systems Theory* (Boulder, CO: University Press of Colorado, 2003); Robert Lilienfeld, *The Rise of Systems Theory: An Ideological Analysis* (New York: John Wiley & Sons, 1978); Peter Mortensen, "Introduction: Green Countercultures," *Ecozon@* 4:1 (2013), 1-11. For details on the historical evolution of systems thinking as a conceptual and scientific frame for the symbol of Spaceship Earth, see Chapter 1.

[512] Alfred Hassler, "Of the Making of Peace," August 2, 1963, Box 1, Origins, SCPC; Martin Luther King, Jr., "The Quest for Peace and Justice," December 11, 1964, accessed August 19, 2013, www.Nobelprize.org.

And, with the aid of a global fellowship, both King and Alfred Hassler believed that new social systems could emerge to correct old ones.

In 1967, King's sermon at Riverside Church in New York City further inspired Hassler's efforts to form what became Dai Dong. King castigated the American war in Vietnam, yet he encouraged looking "Beyond Vietnam." King again expressed his vision for a "radical revolution of values" in terms of global systems. Recalling his Nobel lecture in 1964, King reiterated how "All over the globe men are revolting against old systems of exploitation and oppression, and out of the wounds of a frail world, new systems of justice and equality are being born. … We in the West must support these revolutions." King preached a need for "collective solutions" to work for a global "brotherhood of man … beyond national allegiances." In a world of overwhelming poverty, racism and militarism, King argued our only hope meant, "Every nation must now develop an overriding loyalty to mankind as a whole." Emphasizing the "fierce urgency of now," King concluded, "let us rededicate ourselves to the long and bitter, but beautiful, struggle for a new world." After King's pacifist battle cry, Hassler contacted Thich Nhat Hanh to discuss a global and transnational peace fellowship that could explain and find solutions to the broken systems of social integration.

The transnational links between Alfred Hassler, Thich Nhat Hanh, and Martin Luther King mirrored their corresponding visions of the world as an interconnected system. In 1958, after collaborating on the comic book about non-violent resistance, King joined the FOR-USA, just as Hassler began his first year as

its director.[513] King and Hassler maintained friendship and contact, particularly during Hassler's journeys to Vietnam in the mid-1960s to halt American war efforts and promote Vietnam's indigenous, nonviolent Buddhist movement.[514] Hassler met Nhat Hanh through this work and promoted Nhat Hanh's pacifist activism through world tours sponsored by the International FOR. In 1966, Hassler introduced King and Nhat Hanh, who together promoted peace in Vietnam at press conferences.[515] And early in 1967, as Hassler built momentum in the FOR to found Dai Dong, King nominated Thich Nhat Hanh for the Nobel Peace Prize, stating, "I do not personally know of anyone more worthy of [this prize] than this gentle monk from Vietnam. His ideas for peace, if applied, would build a monument to ecumenism, to world brotherhood, to humanity."[516] Following King's murder, Hassler and Nhat Hanh created Dai Dong, a fellowship for humanity, to globally expand and shape the social systems King saw emerging in the mid-1960s. By the late 1960s, during the global environmental moment, Hassler aimed to unify those holistic social integrations through the systems of ecology.

By the time Alfred Hassler founded Dai Dong in 1969, just as the global environmental moment triggered a set of environmental revolutions across much of

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[513] Paul Dekar, *Creating the Beloved Community*, 18.

[514] Martin Luther King, Jr., "Cablegram to FOR Executive Director Alfred Hassler in Saigon, July 5, 1965," Martin Luther King, Jr. and the Global Freedom Struggle, accessed August 19, 2013, http://mlk-kpp01.stanford.edu/index.php/encyclopedia/chronologyentry/1965_07_05. King's cable to Hassler read: "The war in Vietnam must be stopped... While we are all concerned about Communist invasion, we must instill in the mind of our nation that the way to fight Communism is not through bombs, guns and gases. It is through economic and political programs that will convince the people of the world that only in democratic society can man prosper and develop to his full potential."

[515] Alfred Hassler, *Saigon, U.S.A.*, with introduction by Sen. George McGovern (New York: Richard W. Baron, 1969); "Highlights in IFOR History," *Fellowship* (September/October 1994), 15; "King, Monk Seek Bombing End," *Chicago Sun-Times*, June 1, 1966.

the global North, the observations and predictions of ecologists and biologists appeared to Hassler "like a compilation of nightmares by Hieronymus Bosch."[517] As addressed in Chapter 2, scientists like Linus Pauling, Barry Commoner, and Paul Ehrlich moved beyond academia to publically pronounce worldwide dangers about nuclear fallout radiating children's bones, poisonous chemicals coating crops and water sources around the globe, and burgeoning populations surging past planetary food supplies. At the same time, American rivers were igniting in flames, oil had drenched coastlines from southwest England to Southern California, and pollution belching technologies from Siberia to South Africa blackened skies and threatened to make the newly christened Spaceship Earth ecologically uninhabitable for humans.[518]

The newly realized threats of global environmental collapse influenced Hassler to use his new non-governmental organization to take action on the global environmental crisis, just as it did for many nation states in the UN with their nascent plans for the UNCHE. For his part, Hassler committed Dai Dong to the important task of highlighting the magnitude of the global environmental crisis as a

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[516] Martin Luther King, Jr., "Nomination of Thich Nhat Hanh for the Nobel Peace Prize," January 25, 1967, World History Archives, posted January 16, 1996, accessed February 11, 2011, http://www.hartford-hwp.com/archives/45a/025.html.

[517] Alfred Hassler, "Some Notes on the Shape of the Future," January 2, 1970, Box 1, Origins, SCPC.

[518] Paul R. Ehrlich, *The Population Bomb*, (New York: Ballantine Books and the Sierra Club, 1968). See also the papers delivered at the 13th National Conference of the U.S. National Commission for UNESCO, "Man and His Environment: A View Toward Survival," November, 1969, in *No Deposit – No Return*, edited by Huey D. Johnson, (Reading, MA: Addison-Wesley Publishing Co., 1970); Harry Trimborn, "Battle Shaping Up Over Offshore Oil; Seep Continues; Conservationists, Industry Clash," *Los Angeles Times,* February 2, 1969, 1; Gladwin Hill, "Environment May Eclipse Vietnam as College Issue," *New York Times*, November 30, 1969, 1; Anthony Lewis, "Not a Bang but a Gasp," *New York Times*, December 15, 1969, 46. J. R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (New

means to communicate simultaneously the magnitude of the social, political, and economic changes he deemed necessary for human survival. Dai Dong's message, therefore, identified the environmental crisis as a moral crisis that demanded systemic change on a planetary scale, including changes not just to industrial economics but also to the structures of geopolitics beyond its basis in national sovereignty.[519]

To better promote Dai Dong's global message for change, Hassler tapped limited FOR funds to open two offices. Although notwithstanding Dai Dong's Chinese name and its transnational self-identification, both offices were located in nations of industrialized global North: one was outside New York City, where Hassler operated as Executive Director; and another was in Copenhagen, lead by European director, Jens Brøndum, chairman of the Scandinavian FOR and a pastor at the Technical University of Denmark. A shoestring budget limited both staffs to just a handful of paid workers who relied heavily on volunteers and donations. Despite, its humble beginnings and geographical placement in the global North, Dai Dong projected a broad front by leveraging the authority of scientific experts on global environmental threats.[520]

York: W.W. Norton & Co., 2000), offers a cogent analysis of global environmental challenges. See also Chapters 2 and 3 of this dissertation.

[519] "Summary of Dai Dong Meetings", October 9, 1969, Box 2, Organizing Meetings, SCPC.

[520] Alfred Hassler, "Some Questions and Answers about Dai Dong," November 23, 1971, Box 1, Reports to National Council, SCPC.

Leveraging Scientific Authority

After adopting systems thinking to synthesize ecological concerns with notions of social justice, Hassler identified global environmentalism as an all-encompassing tool for ending war, overturning sovereignty, arresting overpopulation, and promoting an equitable balance for both humanity and nature. By the end of 1970, Hassler concluded that global collapse "could be averted only by a world-wide effort designed to curb the ambitions of the great sovereign states and the great, almost equally sovereign corporations, and to redirect our culture and technology toward planned, humanistic, and environmentally acceptable goals."[521] Dai Dong's purpose, one staff member wrote, was to build a "sense of world community by dramatizing through a variety of actions the interrelatedness of our global problems, and the practical (not to say moral) necessity of coming together to solve them."[522] Who better to express this message than a collection of authoritative biologists and ecologists?

Shortly after forming Dai Dong, an article in *Science* caught Hassler's attention. Writing with urgency, professor of biophysics, John R. Platt, framed the era's "crisis of crises" as "all beginning to be world problems." Solutions required efforts similar to "the mobilization of scientists" in wartime:

> we are going to need large numbers of scientists forming something like research teams or task forces for social research and development. We need full-time interdisciplinary teams combining men of different specialties…who can put together our stores of knowledge and powerful new ideas into improved technical methods, organizational designs, or

[521] Alfred Hassler, "Dai Dong Thé Gioi," December 9, 1970, Box 1, Explanation of Name, Purpose, SCPC.

[522] Tom Artin, *Earth Talk: Independent Voices on the Environment* (New York: Grossman Publishers, 1973), 12.

> 'social inventions' that have a chance of being adopted soon enough and widely enough to be effective.

The world, Platt concluded, needed "a deeper systems analysis" led by interdisciplinary, scientific councils who could devise "new mechanisms to help us survive." Hassler channeled these insights into Dai Dong's earliest efforts.[523]

Hassler took seriously the opinions of scientists regarding global problems and their ideas for resolving the world's greatest challenges. He saw scientists in a progressively secular society as the most universal authority figures, as revered experts who could best annunciate the challenges of the modern world, and also offer solutions. The application of scientific systems thinking for diverse challenges—from fighting wars against communism or poverty, to renewing urban planning, even sending humans to the moon—reflected general faith in the sanctity of science and scientist's expertise.[524] Hassler would use scientific authority to impress on the planet's citizens and political leaders the need for peaceful, planetary change if humanity was to survive the onslaughts of environmental destruction, social exploitation, and deadly wars, like the one then raging through Vietnam.

In May 1970, one month after millions of Americans mobilized in the first Earth Day demonstrations, Hassler organized along the Riviera in Menton, France an intimate conference intended as "the first step in the launching of [Dai Dong's]

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[523]John Platt, "What We Must Do," *Science* 166 (November 28, 1969), 1115-1121. Hassler distributed Platt's article to Dai Dong staff. See Alfred Hassler, "Dai Dong Thé Gioi," December 9, 1970, Box 1, Explanation of Name, Purpose, SCPC.

[524] Jennifer S. Light, *From Warfare to Welfare: Defense Intellectuals and Urban Problems in Cold War America* (Baltimore: Johns Hopkins University Press, 2004); Stephen Bocking, *Nature's Experts: Science, Politics, and the Environment* (New Brunswick, NJ: Rutgers University Press, 2006), 16. See also Chapter 1.

world-wide, transnational peace movement."[525] In Menton, six international environmental scientists met under the sponsorship of Dai Dong and the FOR. Hassler tasked the scientists with drafting a declaration based on their special knowledge of the nature and broad threat of the global environmental crisis, which voiced their conclusions for overcoming the crisis. Once the scientists in Menton crafted their declaration, Hassler aspired for the success of earlier scientists' declarations—like Linus Pauling's appeal to abolish nuclear weapons—by circulating the statement for signatures from other authorities and pushing collectively for global change.[526] Hassler hoped the statement created in Menton would garner signatures from other environmental specialists across the world's ethnic, political, and religious traditions, which Dai Dong would use to highlight the importance and authority of their own message for establishing global peace with and on Spaceship Earth.

By organizing the Menton conference, Hassler positioned himself, and, by association, Dai Dong, as a knowledge broker that leveraged the authority and expertise of science for its own political purposes. Throughout the twentieth century, especially in the industrialized world, scientists gained unprecedented prestige and authority through vast accumulation of empirical and theoretical knowledge, which in turn fostered technological innovations and solutions to practical problems.

[525] Dai Dong staff, "Letter to Prof. Larry Slobodkin," March 25, 1970, Box 2, Menton Conference of Scientists, 1970, SCPC.

[526] Linus Pauling, "An Appeal by American Scientists to the Governments and People of the World," *Bulletin of the Atomic Scientists* 13 (September 1957). As noted in Chapter 2, Pauling's petition argued that fallout from nuclear weapons testing damaged "the health of human beings all over the world" and endangered "future generations," thus becoming an early instigator of the global environmental moment.

Hassler sought to hitch Dai Dong's prestige to that of the scientists in Menton and its later signatories. With the scientists' statement, Dai Dong could assert the reliability and authority of science while translating it and making it accessible to a broader audience, thereby positioning itself as a knowledge broker and mediator between scientific and political communities. In Hassler's eyes, Dai Dong could then help influence the growing awareness of global environmental challenges and encourage the particular actions it believed necessary for linking the global environmental moment with Dai Dong's broader consideration of worldwide problems like war, racism, and economic exploitation.[527]

Over several days, the six scientists in Menton drafted a statement that redefined Dai Dong's identity and shaped its future activism. The scientists included a Vietnamese biologist who was also an exiled Buddhist nun living in France; two American biology professors; a zoologist and former university rector from Holland; a physicist from the Max Plank Institute in West Germany; and a French physician and biologist who directed the Pasteur Institute in Paris.[528] Reflecting Dai Dong's systems approach, they argued that, despite great geographic, linguistic, cultural, and political differences among the world's people, "unprecedented…global and interrelated" dangers now forced humanity's unification. Solutions, they wrote,

[527] On knowledge brokers, see Karen T. Liftin, *Ozone Discourses: Science and Politics in Global Environmental Cooperation* (New York: Columbia University Press, 1994); Karen T. Liftin, "Framing Science: Precautionary Discourse and the Ozone Treaties," *Millennium: Journal of International Studies* 24:2 (1995): 251-277.

[528] The Menton scientists included biologist and Buddhist nun, Cao Ngoc Phuong, of Vietnam (then exiled in France, like her colleague Thich Nhat Hahn); Conrad A. Istock, Professor of Biology, University of Rochester, New York; Lawrence Slobodkin, Professor of Biology, SUNY, Stony Brook; Donald J. Juenen, Professor of Zoology and former Rector, University of Leiden, Holland; Klaus Meyer-Abich, physicist, Max-Plank Institut in Starnberg, West Germany; Pierre Lépine,

demanded people abandon their "limited selfish interests to the realization of a common need."[529] Addressed not to national governments of sovereign states, but to individual citizens of the world, they entitled their declaration, "A Message to Our 3.5 Billion Neighbors on Planet Earth," otherwise known as the Menton Statement.[530]

The Menton Statement

The Menton Statement highlighted four interrelated problem areas. The first two, environmental deterioration and depletion of natural resources, seized upon the newly realized concerns in industrial nations of the global North about the environmental dangers of industrial development and pollution. Noting that the unprecedented rate of environmental deterioration seemed irrelevant to less-industrial parts of the world, the scientists applied a global systems viewpoint that "there is only one environment; what happens to a part affects the whole."[531] And, similar to the ecological sentiments of economists like Barbara Ward and Kenneth Boulding, the Menton scientists' focus on depleting natural resources noted how Spaceship Earth could not provide resources in amounts sufficient for everyone to live at consumption levels enjoyed by the rich. Additionally, they warned, disparities

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physician, biologist, and director of the Pasteur Institute, Paris, France. "Menton Conference, Names of Participants," April 15, 1970, Box 2, Menton Conference of Scientists, 1970, SCPC.

[529] Ibid.

[530] "The Menton Statement," May 1970, Box 2, Menton Statement, 1970-71, Text, SCPC; reprinted as "A Message to Our 3.5 Billion Neighbors on Planet Earth," *The UNESCO Courier* (July 1971).

[531] Ibid.

in life style and wealth provided a dangerous feedback loop, fueling escalation of conflict and revolution.[532]

Overpopulation and war constituted the Menton scientists' other interrelated problem areas. Their neo-Malthusian fears of over-crowding and hunger echoed similar concerns among biologists like Garrett Hardin and Paul R. Ehrlich.[533] With world population then at 3.5 billion, the Menton scientists doubted new technologies could feed the 6.5 billion people expected on Earth by the year 2000. Even if technology could "produce enough synthetic food for all," they warned, the over-crowding of rising populations would likely generate "disastrous social and ecological consequences." The Menton scientists accounted for consumption and global equity in their neo-Malthusian analyses, preempting Paul Ehrlich's eventual consideration of global contexts.[534] They noted specifically how Americans consumed far more than people in highly populated India, with those fewer Americans producing much greater pollution.

The Menton scientists lastly castigated the horrors of war, particularly the arsenals of nuclear, chemical, and biological weapons. Emphasizing Dai Dong's pacifist and transnational objectives, the scientists argued the dangers of war focused on two points of global justice: rising inequity between industrialized and non-industrialized parts of the world, as impoverished millions determined to improve

[532] Ibid; Barbara Ward, *Spaceship Earth* (New York: Columbia University Pres, 1966); Kenneth E. Boulding, "The Economics of the Coming Spaceship Earth," in *Environmental Quality in a Growing Economy*, edited by H. Jarrett (Baltimore: Johns Hopkins University Press, 1966), 3-14. See Chapter 2 for analysis on Ward and Boulding's visions of Spaceship Earth.

[533] Garrett Hardin, "The Tragedy of the Commons," *Science* 162 (December 13, 1968): 1243-1248; Ehrlich, *The Population Bomb*.

their lot; and, competition for power and economic advantage between anarchic nation-states unwilling to relinquish selfish interests for the greater planetary good.[535] The scientists invited to Menton by Dai Dong were clearly caught up in the global environmental moment. While many of the same issues addressed in Chapters 1 through 3 of this dissertation led nation states to direct their concerns through the United Nations, Dai Dong's Menton scientists suggested an approach that looked beyond the confines of national boundaries.

To combat the interrelated torments of pollution, resources, population, and war, the Menton scientists suggested four responses—not as panaceas, but "holding actions"—to prevent global crises moving beyond "the point of no return." They proposed a total moratorium on untested technologies not essential to human survival, including "new weapons systems, luxury transport [like supersonic planes], new and untested pesticides, the manufacture of new plastics, [and] the establishment of vast new nuclear power projects." This included ecologically un-researched projects like damming great rivers, clear cutting forests, and deep-sea drilling projects. They next encouraged slowing the exhaustion of resources with existing pollution-control technologies for energy and industrial production, and rapidly establishing international accords on environmental quality. Third, the Menton scientists urged intensified programs to halt global population growth, noting carefully these must avoid abrogation of human rights. Lastly, mirroring Dai Dong's pacifism, the scientists demanded the abolishment of war to prevent "the

[534] Paul R. Ehrlich and John P. Holdren, "Impact of Population Growth," *Science* 171 (1971): 1212-1217. See also Thomas Robertson, *The Malthusian Moment: Global Population Growth and the Birth of American Environmentalism* (New Brunswick, NJ: Rutgers University Press, 2012).

extermination of the human species." These actions must be demanded and adopted not just be the world's nations but achieved through the concerted actions of individuals all around the world.[536]

The Menton scientists concluded that the Earthrise photo and recent moon landing showed how "Earth, which has seemed so large, must now be seen in its smallness." Humanity, they continued, must realize "we live in a closed system, absolutely dependent on Earth and on each other." To ensure survival, the Menton scientists believed it "literally true that only by transcending our divisions will men be able to keep Earth as their home." Solutions to the global challenges of war, pollution, hunger, and over-population, they warned, "may be simpler to find than the formula for the common effort through which the search for solutions must occur, but we must make a beginning."[537] It offered a humble finale to an otherwise alarming statement by biological and environmental authorities. Their statement, Hassler mused after the conference, "lacks the kind of melodrama to be found in the speech in Missouri by C. P. Snow … or of the works of Paul Ehrlich, but seems to me to be even stronger by reason of its restraint."[538]

In the realm of science, knowledge is most valid and persuasive when presented as universal and applicable everywhere.[539] If Dai Dong was to become truly transnational, it first must become a global, universal knowledge broker. Hassler's global ambitions lead to distributing the Menton declaration for signatures

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[535] "The Menton Statement," SCPC.
[536] Ibid.
[537] Ibid.
[538] Alfred Hassler, "Some Miscellaneous Notes on the Menton Conference," May 1970, Box 2, Menton Conference of Scientists 1970, SCPC.

by environmental scientists from all around the world. Hassler hoped a uniformly supported Menton Statement could capture enough media attention that millions around the world would realize the common environmental predicament then facing the world, and join the newly authoritative Dai Dong in its transnational effort toward planetary solutions.[540] Hassler's use of the Menton Statement to promote both Dai Dong and its transnational message for planetary unity to confront planetary dangers eventually catapulted Dai Dong into the realm of global environmental politics. Dai Dong's efforts soon intersected with those of the UN, though each organization had very different ideas for how to save Spaceship Earth in the global environment moment.

From Menton to the United Nations and Beyond

After the Menton conference, Dai Dong promptly sent its statement to biology departments mostly in nations of the global North, like Europe and North America, but also throughout the global South to environmental experts in Asia, Africa, and South America. In less than a year, over 2,200 biologists, ecologists, and environmental experts from twenty-four nations had signed the Menton Statement, including four Nobel laureates: Salvador Luria, Jacques Monod, Albert Szent-Gyorgi, and George Wald. Other noted signatories included Paul R. Ehrlich, Garrett Hardin, Margaret Mead, E. W. Pfeiffer, Sir Julian Huxley, Thor Heyerdahl, Gerado Budowski, René Dumont, Jean Rostand, Lord Ritchie-Calder, Enrique Beltran, and

[539] Bocking, *Nature's Experts*, 18-19.
[540] Dai Dong staff, "Letter to Prof. Larry Slobodkin," March 25, 1970, Box 2, Menton Conference of Scientists, 1970, SCPC.

Mohamed Zaki Barakat. Some signatories, like Ehrlich, also sent checks to support Dai Dong's efforts. Dai Dong's reply to Ehrlich gushed, "As you must know, your writings have influenced us a great deal in our thinking."[541] Less than two years after Hassler founded it, Dai Dong, achieved global recognition from environmental experts. Next, Hassler sought global influence.

What better organization for Dai Dong to deliver its global message than the United Nations, the world's best-known forum for global political dialog? In the spring of 1971, Hassler contacted the UN headquarters in New York in hopes of presenting the Menton Statement to U Thant, the UN Secretary-General, and to Maurice Strong, who had recently accepted the responsibility of planning the UNCHE that would occur the next year in Stockholm. In writing to U Thant and Strong, Hassler emphasized how the Menton Statement, supported by thousands of the world's environmental experts, diagnosed the "overwhelming problems that face humanity today" and made explicit "the interrelationships between the problems."[542] U Thant and Strong, looking to publicize the upcoming UNCHE, welcomed the opportunity both to formally receive the Menton Statement and meet with prominent scientists who supported it.[543]

Even before Hassler's meeting with Maurice Strong and U Thant, Dai Dong's Menton Statement helped encourage the UN to adopt more scientific support

[541] "Letter to Dr. Paul R. Erhlich," October 28, 1970, Box 4, Menton Statement correspondence, SCPC. See also Box 3, Menton Statement: UNESCO Courier, Circulation to Scientists, Int'l Sponsors, SCPC.

[542] Alfred Hassler, "Letter to Mr. Narasimham, UN Secretariat," March 4, 1971, UNARMS, accessed February 27, 2011, http://archives-trim.un.org/webdrawer/rec/422866/.

[543] C.V. Narasimham, "Letter to Alfred Hassler," March 17, 1971, UNARMS, accessed February 27, 2011, http://archives-trim.un.org/webdrawer/rec/422866/.

for the UNCHE. Immediately after scheduling Hassler and the Menton scientists' reception, Strong asked acclaimed microbiologist René Dubos to create and head an international committee of environmental experts to assemble the first scientific report on the world environment.[544] Economist Barbara Ward used material from Dubos's committee for the book, *Only One Earth*, which both Dubos and Maurice Strong described as the "conceptual framework" for the UNCHE. Strong celebrated its "invaluable guidance in the formulation of scientific issues" as "an integral part of preparations" for the UNCHE.[545] Dai Dong thus helped instigate one of the first reports on the state of the global environment.

On May 11, 1971, U Thant and Strong received Dai Dong's Menton Statement and also met several of the Menton Statement's authors and signers, including Nobel laureate George Wald. In a public relations boon to Dai Dong's transnational message, Thant reiterated the scientists' "grave warning that our world may be irremediably damaged unless a concerted global effort" was made "simultaneously at the individual, the national, and the international level." Thant proclaimed how the scientists' "urgent message … must be heeded—and acted upon—without delay." Thant hoped Dai Dong's warning about humanity's shared global dangers, which he agreed carried "the seeds of extinction for the human species," just might be "the elusive force" to bind humanity together. The "battle for human survival," Thant concluded, could "only be won by all nations and peoples

[544] René Dubos, "Letter to Barry Commoner" April 23, 1971, Box 212, Papers of Barry Commoner, Library of Congress Manuscript Division, Washington, DC (hereafter LCMD); René Dubos, "Report on the World Environment," September 3, 1971, Box 217, LCMD; Maurice Strong, "Letter to Barry Commoner," October 25, 1971, Box 217, LCMD.

joining together" in a concerted effort to preserve life on Earth. Thant wished Hassler continued successes in expanding Dai Dong's program.[546]

Hassler, through Dai Dong's presentation of the signed Menton Statement, provoked increased scientific input for the upcoming UNCHE in 1972, while also gaining greater global notoriety for Dai Dong. In July 1971, *The UNESCO Courier* printed the Menton Statement as its cover article, where it was translated into twelve different languages and distributed to more than a half-million global subscribers, including tens of thousands in the Soviet Union alone.[547] *The Courier*'s publication of Dai Dong's first initiative further catapulted the young organization to its brief but widespread recognition in the global environmental moment. In less than two years, while working from a shoe-string budget, Dai Dong managed to capture global notoriety, to wield a small degree of international influence, and widely proclaim its message that the world's people must forgo their national, racial, and economic differences to overcome the threats then endangering the planet.

Despite their success and influence with the Menton Statement, Hassler and many of the Menton scientists remained unsatisfied. After all, one of the Menton Statement's primary points, and a driving construct for Dai Dong, was that environmental pollution, depletion of resources, overpopulation, and warfare were, in Hassler's words, "concomitant of present-day nation states," both communist and capitalist, and "all of them are direct threats to human survival." Hassler's letters to

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[545] Maurice F. Strong, preface to *Only One Earth: The Care and Maintenance of a Small Planet*, by Barbara Ward and René Dubos (New York: W. W. Norton & Company, 1972), vii-ix.

[546] U Thant, "Secretary-General's Response to Environmental Scientists," May 11, 1971, UNARMS, accessed February 27, 2011, http://archives-trim.un.org/webdrawer/rec/422866/.

Menton signers emphasized that humanity could find salvation only through a transnational, global fellowship "in which the sovereign ambitions of nations, the narrow objectives of giant corporations, and the self-seeking desires of individuals are subordinated."[548] Dai Dong sought global fellowship and environmental harmony by overturning the structures of national sovereignty. With the UN predicated on the promotion of global politics within the confines of nation-state-based diplomacy, Hassler knew Dai Dong's next step must transcend the UN and its upcoming UNCHE in Stockholm.

Challenging Sovereignty and the UNCHE with an Independent Conference

After their private meeting with U Thant and Maurice Strong, Hassler and the Menton signers became increasingly convinced that the problem with the UNCHE lay in the structure of the UN itself. The foundation of the UN, after all, was built around the sanctity of nation-state sovereignty. And the traditional rights of sovereignty enabled nations to pollute, populate, and exploit resources, even at the expense of global neighbors and despite awareness of the interconnected biosphere.[549] Hassler and the Menton scientists thus found the UN an improper institution for fostering global, transnational change. As the global environmental moment coalesced toward Stockholm, Hassler looked outside the confines of the UN

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[547] "A Message to Our 3.5 Billion Neighbors On Planet Earth," *The UNESCO Courier* (July 1971).

[548] Alfred Hassler, "Letter to Dr. Donald A. Chant," June 1971, Box 4, Independent Conference on Environment, Preparations, Staff correspondence, SCPC.

[549] For the rights of sovereignty in environmental contexts, see Karen T. Liftin, ed., *The Greening of* Sovereignty *in World Politics* (Cambridge, MA: The MIT Press, 1998), especially Paul Wapner, "Reorienting State Sovereignty: Rights and Responsibilities in the Environmental Age," 275-297.

to promote Dai Dong's message that solving global problems—including environmental ones—required transnational unity and new modes of equity, not just between nations, but in a worldwide human fellowship of individuals. Nonetheless, with worldwide attention to global environmental problems soon to be focused on Stockholm, the UN gathering there offered an opportunity to spread Dai Dong's alternative message. As a result, Hassler announced near the end of 1971 that Dai Dong would hold its own Independent Environmental Conference in Stockholm, parallel to the UNCHE in June 1972. Dai Dong thus helped create an outer ring of events at Stockholm's environmental circus that simultaneously challenged the UNCHE while also seeking to influence it.[550]

Due to the UNCHE's multi-year planning process, as detailed in Chapters 3 through 5, the UN's first intergovernmental summit on the global environment eventually unfolded as a limited convocation of diplomats, where influential delegations sought to secure, despite much rhetoric of environmental independence, a continuation of the industrial and sovereign status quo. As addressed in the prior chapter, the UNCHE did narrowly produce a Declaration on the Human Environment, numerous non-binding recommendations for action by UN member-states, and what eventually became the underfunded United Nations Environment Program (UNEP). But, ultimately, the UNCHE reified national sovereignty and institutionalized the UN's favor for promoting sovereign industrial development as an unclearly defined solution for international environmental problems.[551] Those

[550] Alfred Hassler, "Letter to Maurice Strong," October 21, 1971, Box 4, Conference on Environment, Stockholm '72, UN Conf relations with Dai Dong, SCPC.

[551] See Chapter 6.

developments were exactly what Alfred Hassler hoped to forestall and challenge with Dai Dong's Independent Conference on the Environment.

Hassler scheduled Dai Dong's Independent Conference to occur just before the UNCHE and also in Stockholm, yet he maintained that Dai Dong's conference was not an anti-UN meeting. Instead, Hassler hoped Dai Dong could capture some of the international attention focused on global problems at Stockholm to better promote Dai Dong's transnational message of a global fellowship for saving Spaceship Earth. Hassler also harbored hope that Dai Dong's message might actually re-direct the UNCHE's debate. In advance of Dai Dong's Independent Conference, Hassler and his small international staff created Dai Dong's own draft declaration to dramatize the depth and interrelation of global crises, noting how environmental problems required a strong, unified response that included but moved beyond the separate interests of sovereign states. Looking to replicate Dai Dong's triumph with the Menton Statement, Hassler hoped Dai Dong's Independent Conference would then agree uniformly upon this Independent Declaration, which explained the inherent interconnection of the global environmental crisis with other worldwide social and economic problems.

Hassler and his Dai Dong colleagues in Europe envisioned Dai Dong's Independent Declaration would address inclusively the problems of war, the redistribution of wealth, and the incompatibility of ecology and industrial development, none of which the UNCHE planned to discuss.[552] By holding the Dai Dong conference before the UNCHE, they not only hoped Dai Dong's Independent

Declaration would gain global attention in its own right, they also hoped Dai Dong own powerful and unified declaration could encourage the UNCHE to incorporate Dai Dong's broader perspective. As the global environmental moment moved toward its apex, and as various international environmental NGOs like Dai Dong began to flower, Dai Dong held firm to its transnational identity and aimed to overcome the limitations of nation-state-centered politics inherent in the UN.[553]

Dai Dong thus rode the waves of the global environmental moment to Stockholm in the summer of 1972. While intersecting at times with the UN, Dai Dong's trajectory from Menton to Stockholm reveals its alternative interpretation for how to confront global environmental challenges and the interrelated social and economic issues associated with and producing environmental degradation. Rather than advocate environmental solutions through the structures of national governments, Dai Dong sought to promote a grassroots approach for addressing global challenges. Scheduled to overlap slightly with the UNCHE, Dai Dong's Independent Conference on the Environment established an outer ring for Stockholm's environmental circus. Despite Dai Dong's message of transnational unity as a prerequisite for solving global problems, its Independent Conference on the Environment would eventually fracture in ways quite similar to the North-South

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[552] Jens Brøndum, "Independent Dai Dong Conference, June 2-6, 1972" (n.d.), Box 4, Independent Conference on Environment, Mailings and Releases, SCPC.

[553] On NGOs, see Paul Wapner, *Environmental Activism and World Civic Politics* (Albany, NY: State University of New York Press, 1996); Peter Willetts, ed., *'The Conscience of the World': The Influence of Non-Governmental Organizations in the UN System*, (Washington, D.C.: The Brookings Institution, 1996); Akira Iriye, *Global Community: The Role of International Organizations in the Making of the Contemporary World* (Berkeley: University of California Press, 2002).

divisions between sovereign nations during the preparatory process and performance of governments at the UNCHE, inside Stockholm's inner ring.

Dai Dong's North-South Debate at Stockholm's Environmental Circus

Hassler invited a diverse collection of environmental scientists and other scholars—both men and women from sundry racial, religious, political, and national backgrounds—to meet in Stockholm from June 2 to 6, 1972. Seeking to represent the vision of global togetherness represented in Dai Dong's very name, Hassler was adamant that Dai Dong's Independent Conference "must not be dominated by Americans or United States ideas."[554] As a result, Dai Dong's conference featured thirty-two participants from twenty-four countries in regions across the world. Nearly half of Dai Dong's attendees came from less developed nations and, while the Soviet Union and its Eastern European allies boycotted the UNCHE, Dai Dong's conference featured three participants from Eastern Europe. These independent experts included doctors from Nigeria and Kenya, a chemical engineer from Japan, a biologist from Vietnam, an entomologist from India, ecologists from Iran, Poland, and Chile, a sociologist from Hungary, and other environmentally inclined specialists from North America, Western Europe, and Eastern Europe.[555]

Despite Dai Dong's message of unity, and perhaps due in part to the global diversity of social and environmental backgrounds of its attendees, Dai Dong's Independent Conference on the Environment in Stockholm failed to unite over

[554] Alfred Hassler, "Letter to Dr. Donald A. Chant," June 1971, Box 4, Independent Conference on Environment, Preparations, Staff correspondence, SCPC.

several major points that Hassler had included in Dai Dong's draft Independent Declaration. Not unlike the challenges in finding rhetorical agreement in drafting the UNCHE's environmental declaration, consensus among Dai Dong's thirty-two environmental experts proved impossible over three main issues: sovereignty, pacifism, and population—the primary points that had set Dai Dong's intentions apart from the UNCHE in the first place![556] Tom Artin, a humanities professor who volunteered with Dai Dong in Stockholm, recalled how Hassler and his delegates were "quite unprepared for the depth of the division over [these issues], which threatened at several points to tear the [Independent] conference apart."[557] Mirroring divisions between nations of the global North and those of the global South within the UN, the deepest divisions at Dai Dong's Independent Conference arose between young scientists from less developed nations and older experts from relatively wealthy and industrialized nations.

In an effort to maintain Dai Dong's transnational identity, Hassler had invited to Stockholm several radical, young scientists who called themselves the Oi Committee International, including its de facto leader, M. Taghi Farvar.[558] Farvar, originally from Iran, had just completed his Ph.D. at Washington University in St. Louis under the mentorship of environmental scientist Barry Commoner. Farvar's thesis examined ecological and social damage caused by industrial exploitation in

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[555] "Report: Invitations Accepted By," May 8, 1972, Box 4, Independent Conference on Environment, Preparations, Staff correspondence, SCPC.

[556] Alfred Hassler, "Plenary Meeting," June 3, 1972, Box 4, Independent Conference on Environment, Plenary Sessions, SCPC.

[557] Artin, *Earth Talk*, 66.

[558] Alfred Hassler, "Letter to Jens Brøndum," February 1, 1972, and Jens Brøndum, "Letter to Alfred Hassler," March 29, 1972, Box 4, Independent Conference on Environment, Preparations, Staff correspondence, SCPC.

Central America resulting from chemical pesticides. In addition to his experiences with Commoner at the Airlie House conference on ecological harm from international development, Farvar arrived in Stockholm well primed to argue how actions by governments and industries in the global North bore the greatest responsibility for global environmental damage.[559] At Dai Dong's Independent Conference, Farvar thus took on the role of radical advocate for people from the global South, similar in ways to the roles of Brazil and China at the UNCHE. Dai Dong volunteer Tom Artin described Farvar's appearance in Stockholm as if he was a movie villain:

> Taghi's face looks beaked like a hawk's. Curly black hair comes almost to his shoulders; from his temples it flows down in thick muttonchops over his cheeks, then across his mouth as a mustache. Black horn-rims goggle his eyes. His articulate English is flawless…though he speaks with a peculiar, clipped intonation hard to place. … His viewpoints derive in large measure from Barry Commoner's … [H]e says he has the Third-World perspective.

Additionally, Farvar, like his mentor, never signed the Menton Statement because of the statement's advocacy that overpopulation was a global environmental problem. Both Commoner and Farvar considered Dai Dong's neo-Malthusian prescriptions not only ecological wrong and unscientific; they believed the popularity in the global North of ideas to control overpopulation were imperialist and unacceptable.[560]

Members of the Oi Committee rejected outright any concern for overpopulation and considered population control an affront to the hard-won

[559] Mohammed-Taghi Farvar, "Ecological Implications of Insect Control in Central America: Agriculture, Public Health, and Development" (PhD diss., Washington University, May 1972); M. Taghi Farvar and John P. Milton, eds., *The Careless Technology: Ecology and International Development* (New York: Natural History Press, 1971).

sovereignty of peoples from less developed nations in the global South. Some Oi members argued that only "racists and imperialists" worked toward population control. Furthermore, in opposition to Dai Dong's deeply held faith in pacifism, many Oi scientists believed only direct, radical, and revolutionary action—including the use of violence—would enable oppressed people of the global South to overturn ongoing social and economic imperialism, rectify global inequities, and establish sovereign nationhood.[561] Differences between delegates at Dai Dong's conference were not primarily scientific; they were political—similar to the political conflicts between Northern and Southern nations during the UNCHE planning process and its activities in Stockholm. A journalist for *Science* complained that, in Stockholm, the Oi Committee's politics so overshadowed its environmental concerns that "independent discussion ceased to be a possibility."[562] At the height of the global environmental moment in Stockholm, environmental politics fractured between North and South both within the UN's inner ring of the UNCHE and in the outer ring of Dai Dong's Independent Conference.

Although Hassler later blamed Dai Dong's failures in Stockholm explicitly on Farvar and the Oi Committee, both Dai Dong and Farvar's group shared several

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[560] For more on the views of Commoner (and by extension, Farvar) against overpopulation, see Chapter 8.

[561] Dorothy Maas, "Notes on Meeting to Plan Alternative Environmental Conference in Stockholm in June, 1972," September 3, 1971, Box 4, Conference on Environment, Stockholm '72, Alternative Environment Conferences (2), SCPC. See also the chapter "Sovereignty, War, Population" in Artin, *Earth Talk*, 83-130; Dekar, *Creating the Beloved Community*, 136; and, Rowland, *The Plot to Save the World*, 129.

[562] Nigel Hawkes, "Stockholm: Politiking, Confusion, but Some Agreements Reached," *Science* 176:4041 (June 23, 1972): 1309.

affinities.[563] Just as Hassler had formed Dai Dong within the IFOR, Farvar and Commoner established the Oi Committee amid an international forum, at the 1971 International Youth Conference on the Human Environment, in Hamilton, Ontario.[564] And similar to Dai Dong's systems focus on global environmental issues, the Oi group described itself as an "international committee of young scientists and scholars for a critical and holistic approach to development and the human environment."[565] Like Hassler, Farvar and Commoner expressed concern "that the voice of the independent scientific community would not be listened to carefully by the '72 [UN Stockholm] Conference."[566] And, like Dai Dong, the Oi Committee's name reflected a combination of non-Western and global interests. Oi was a Swahili acronym for *Ote iwapo*, meaning "count everything," or "all that is must be considered."[567] Ironically, the greatest difference between Oi supporters and Dai Dong was that the Oi Committee did not count humanity's rising population as an environmental hazard.

Before events unfolded in Stockholm, Hassler had invited the Oi Committee's attendees in order to make Dai Dong's Independent Conference more representative

[563] Alfred Hassler, "Letter to Steering Committee and Staff of Dai Dong," September 7, 1972, Box 1, Steering Committee of Dai Dong, General Correspondence, SCPC.

[564] M. Taghi Farvar, "Letter to Alfred Hassler," November 11, 1971, Box 4, Independent Conference on Environment, Participants, SCPC; Royce LaNier, "Letter to Barry Commoner," September 7, 1971, Box 217, LCMD.

[565] "Oi-Committee Declaration on the Third World and the Human Environment," June 1972, accessed August 19, 2013, http://www.folkrorelser.org/rorelsemapp/dokument/oicommittee.html; Oi Committee International, *International Development and the Environment: An Annotated Bibliography* (New York: Macmillan, 1974).

[566] M. Taghi Farvar, "Letter to René Dubos," May 12, 1971, Box 212, LCMD.

[567] Anonymous, "A Funny Thing Happened to the Environment on Its Way to the Forum" *Stockholm Conference Eco: Jointly Published by The Ecologist and Friends of the Earth*, June 14, 1972, 3; Francis Gendlin, "Voices from the Gallery," *Bulletin of the Atomic Scientists*, September 1972, 27; Rowland, *The Plot to Save the World*, 129.

of global diversity. He had hoped Dai Dong's peaceful and transnational message of fellowship would encourage the Oi Committee's scientists from the global South to harmonize with Dai Dong's older environmental experts, most of whom hailed from the global North. As it played out, however, the presence of Farvar and his Oi Committee colleagues upset Hassler's hopes for unity in producing a strongly worded Independent Declaration. Dai Dong's conference in Stockholm's outer ring featured as much conflict, if not more, than that within the UNCHE's inner ring.

Like the weak UNCHE Declaration, the Dai Dong Independent Conference eventually produced its own weak declaration. Attendees to Dai Dong's conference agreed with Hassler's diagnosis of environmental dilemmas as manifestations of global social crises that demanded new political and economic behaviors. However, beyond that broad agreement, Dai Dong's global prescriptions—its neo-Malthusian concerns, its pacifism, and its efforts to overturn national sovereignty—ran counter to the Oi Committee's political ideologies. As a result, the Independent Declaration to emerge from Dai Dong's outer ring in Stockholm was riddled with statements that various attendees disagreed over, which was also similar to what unfolded in the inner ring of the UNCHE.

Contrarian appendices and partisan signing statements weakened the declaration that emerged from Dai Dong's independent conference in Stockholm. Hassler's delegates achieved consensus on a few issues, agreeing that survival depended on consideration of the total, indivisible environment; that fundamental conflict existed between economic growth and environmental preservation; and that technology must be restructured ecologically. But divisions remained paramount. Oi

members insisted that, "Population is not the most important or the most decisive factor effecting the human environment," while Dai Dong's North American and European delegates complained that "ideological polarities" on the "population factor" had confused the declaration and reduced the issue to a misunderstood controversy. Additionally, Dai Dong's pacifist delegates would only sign the declaration if it made clearer demands for abstinence from war and individual violence.[568] Hassler's pioneering vision may have appealed to many, but his means failed to foster global fellowship or sustain Dai Dong's existence.

On June 9, 1972, a few days after Dai Dong's Independent Conference concluded, Hassler accepted a personal invitation from Maurice Strong to read Dai Dong's Independent Declaration before the UNCHE's plenary session.[569] Despite Hassler's hope to deliverer a hard-hitting declaration that inspired UN diplomats along Dai Dong's transnational philosophy, one observer noted that, "Now it looked as though [Dai Dong's] forthright declaration would just be swallowed, among hundreds of other papers arguing this position or that, like so much plankton down the maw of a whale."[570] After rising to worldwide stature in terms of global environmental issues with the Menton Statement, Dai Dong's performance in Stockholm was ultimately a failure. Its weak and fractured Independent Declaration failed to re-direct the trajectory of the UNCHE. In fact, both conferences seemed to

[568] Afred Hassler, "Statement to the Plenary Session, UNCHE: A Declaration on the Environment," June 9, 1972, Box 4, Conference on Environment, Stockholm '72, UN Conf. Relations with Dai Dong, SCPC.
[569] Ibid.
[570] Artin, *Earth Talk*, 138.

reflect the North-South divisions that still plague international environmental politics today.

For the remainder of its time in Stockholm, during the environmental circus there, Dai Dong continued its efforts in capturing international attention on environmental issues it believed important. For example, during the UNCHE's official deliberations, Dai Dong sponsored various independent seminars emphasizing its utopian hopes for a grassroots fellowship of individuals to solve global challenges. It even helped sponsor a conference against American ecocide in Vietnam. But not of these events generated much attention or influence. For instance, the vast majority of North American media overlooked Dai Dong's events as side-shows, although some European and South Asian media offered limited coverage. Nevertheless, after several weeks in Sweden, Dai Dong's staff and leadership left Stockholm exhausted, dejected, and after so much effort and expense, essentially broke.[571]

After cutting much of its meagerly paid staff, Dai Dong's remaining employees and volunteers attempted two new projects: an economist's statement on the energy crisis and need to transition to a no-growth society, and a statement by world religious leaders relating the environment and religion. Only the former appeared with languid interest from international economists. Dai Dong never again achieved global attention or influence, and by early 1974, its constant financial struggles finally caught up to it. Dai Dong's failure to create consensus at Stockholm

[571] Articles in Box 5, Independent Conference on the Environment, Publicity, SCPC; Alfred Hassler, "Letter to Dai Dong Steering Committee, AFOR National Council, IFOR Executive

and its inability thereafter to strongly influence world opinion resulted in its financial starvation.[572]

Addressing Sovereignty Differently: Dai Dong vs. Friends of the Earth

Hassler leveraged the authority of scientists and interdisciplinary environmental experts to express the integrated nature of Earth's social, political, economic, and ecological systems and reshape them. At that global scale, however, not all actors shared Hassler's particular transnational and environmental perspectives. Despite its plea for transnational fellowship, Dai Dong disbanded shortly after failing to transcend differences in Stockholm over national sovereignty and overpopulation. It then slipped from most historical memories.[573]

Friends of the Earth, however, another international environmental NGO with a grassroots fellowship now over two million strong in seventy-four countries, has survived—even thrived—since its establishment in 1969, the same year that Dai Dong was founded. Why, after Dai Dong's initial surge to global attention with support from leading scientific experts, did it die and Friends of the Earth thrive? The answer rests on the central issue that limited Dai Dong's environmental

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Committee and Secretariat, Miscellaneous Others," June 30, 1972, Box 1, Steering Committee of Dai Dong, General Correspondence, SCPC.

[572] Alfred Hassler, "Farewell, Sweet Council!" February 12, 1974, Box 1, Reports to National Council, SCPC.

[573] The few scholarly publications about Dai Dong derive from Fred Knelman's article on attending Dai Dong's Independent Conference on the Environment in Stockholm: F.H. Knelman, "What Happened at Stockholm?" *International Organization* 28:1 (1972-73), 28-49, reprinted in Richard A. Falk, Samuel S. Kim, Saul H. Mendlovitz, eds., *The United Nations and a Just World Order* (Boulder, CO: Westview Press, 1991), 433-446. Lee-Ann Broadhead, *International Environmental Politics: The Limits of Green Diplomacy* (Boulder, CO: Lynne Rienner, 2002), 36-38, based her brief reference to Dai Dong entirely on Knelman's account.

declaration in Stockholm, the same issue Dai Dong sought to overcome by hosting its independent conference: namely, national sovereignty.

The proliferation of environmental NGOs like Dai Dong in the late 1960s and 1970s saw many activists and international relations scholars identify those organizations as eroding sovereignty. Alfred Hassler, like others, believed national sovereignty and the interdependent biosphere could not co-exist; that a choice must be made between global environmental reconciliation—including control of planetary overpopulation—and a state's exclusive authority within its territorial boundaries.[574] Dai Dong rooted its transnational philosophy in such anti-sovereign environmental activism. However, influential and enduring environmental NGOs like Friends of the Earth have since encouraged scholars of international relations and politics to adopt more flexible understandings of sovereignty. They now see international NGOs not overturning national sovereignty but challenging and revising its norms and practices. Today's scholars identify sovereignty as a socially constructed "cluster of practices undergoing multiple processes of unbundling, contestation, and reconfiguration."[575] When compared to the exploits of Dai Dong, Friends of the Earth helps reveal how global environmental activism and sovereign authority need not exist in opposition.

[574] Falk, *This Endangered Planet;* Ophals, *Ecology and the Politics of Scarcity*; McCormick, "International Nongovernmental Organizations," 131-144; Wenner, "Transboundary Problems in International Law," 165-178; Liftin, *The Greening of Sovereignty in World Politics*, 1-27.

[575] Liftin, *The Greening of Sovereignty in World Politics*, quote on 23; Paul Wapner, "Reorienting State Sovereignty," 275-297; Wapner, *Environmental Activism and World Civic Politics*; Ken Conca, "Rethinking the Ecology-Sovereignty Debate," in *Green Planet Blues: Four Decades of Global Environmental Politics*, Fourth Edition, edited by Ken Conca and Geoffrey D. Dabelko (Boulder: Westview Press, 2010), 65-75.

In 1969, when the Sierra Club discharged David Brower, its executive director, after his political activism severed the Club's tax-exempt status, Brower founded a new organization named Friends of the Earth. Like Alfred Hassler, Brower's vision became increasingly global and devotional. "There is something evangelical about Brower," wrote John McPhee. "Brower is a visionary. He wants—literally—to save the world."[576] And like Hassler's efforts with Dai Dong, Brower led Friends of the Earth in campaigns to achieve maximum publicity and attention to issues he deemed critical to environmental sanctity.[577] In 1971, in Roslagen, Sweden, shortly before the UNCHE, Brower and American Friends of the Earth members joined environmentalists from France, Great Britain, and Sweden to establish Friends of the Earth International.[578] At the UNCHE, Friends of the Earth served as a knowledge broker by co-publishing a daily conference newspaper, *The Stockholm Conference Eco*, which Maurice Strong's senior information advisor described as "required reading … by everyone [in Stockholm] from the Press to the heads of government delegations."[579] Although Friends of the Earth and Dai Dong shared many goals, Friends of the Earth's foundational formula for its transnational coalition approached sovereignty differently.

According to Brower, Friends of the Earth's formula was "to find people in other countries who [shared Friends of the Earth's] own ideas about the limits to

[576] John McPhee, *Encounters with the Archdruid* (New York: Farrar, Straus and Giroux, 1971), 83. See also Brower's advertisement, "Earth National Park," *New York Times*, January 14, 1969, 31.
[577] McCormick, *The Global Environmental Movement,* 171-172.
[578] Friends of the Earth International, "The First Twenty Five Years: A Short History," accessed August 19, 2013, http://www.foei.org/en/who-we-are/about/25years.
[579] Stone, *Did We Save the Earth at Stockholm?*, 55-56. Several editions of *The Eco* are in Folder 466, Box 10, Carl A. S. Coan Collection, Special Collections, Lauinger Library, Georgetown University.

growth…and who [had] a respect for biological diversity. Then these people become the Board of Directors for their own country. They run their own show."[580] Today, Friends of the Earth exists in over seventy countries across the globe, North and South, yet each chapter in its international coalition remains essentially a national NGO. Friends of the Earth's multinational coalition lobbies international organizations and shares support of individual national chapters. Yet, Friends of the Earth's institutional and financial survival hinges on its ability to work within the existing global system based on national sovereignty.

Dai Dong's triumphs and its tragedy, made apparent in Stockholm, was its strict fealty to transnationalism and, in conjunction with neo-Malthusianism, its inflexible opposition to self-determined national sovereignty. Alfred Hassler also failed to establish a set constituency to provide Dai Dong with enduring political power and financial stability. Ironically, an overt focus on lobbying the UN system hampered Dai Dong's effectiveness for global change. The UN, by design, has limited power and influence because UN decisions remain nonbinding over its sovereign members. Friends of the Earth's formula for global activism and expansion accepted the necessity of national sovereignty in order to work toward broad social and environmental improvement. Dai Dong's orthodoxy toward transnationalism and its strict anti-sovereignty led eventually to its dissolution and Hassler's retirement from world-peace work.

[580] Brower quoted in John McCormick, "International Nongovernmental Organizations: Prospects for a Global Environmental Movement," 139, from McCormick's personal communication with Brower.

Working Against World Systems or Within?

Upon Dai Dong's financial collapse, which led to Hassler's retirement, Hassler reflected on Dai Dong's ultimate contributions and impact. In a letter to the European director of Dai Dong, Hassler celebrated how they had "literally made Dai Dong known in much of the world [and made] the Menton Statement a fixture in environmental discussions." However, Hassler could not overlook continued parochialism between different religions, nations, and economies. Dai Dong failed to foster the planetary fellowship Hassler deemed essential to enacting his vision for survival. The reason Dai Dong failed, Hassler suggested was "We lost our coherence."[581] When establishing Dai Dong, Hassler drew upon systems thinking, which arose for the very purpose of keeping complex interactions coherent and actionable. Dai Dong's systems-based peace project lost itself in the complexity of interconnections it hoped to highlight.

In the global environmental moment, Hassler's utopian goals for Dai Dong sought to use environmental rationales to overturn the global order. In the spirit of Martin Luther King, Jr., Dai Dong aimed to create new global systems of peace that could extinguish old systems of destruction that encouraged nationalism, war, exploitation, environmental damage, and the insatiable demand for economic growth. Hassler took seriously Barry Commoner's pronouncement in 1971, "that the world is being carried to the brink of ecological disaster not by a singular fault, which some clever scheme can correct, but by the phalanx of powerful economic,

[581] Alfred Hassler, "Letter to Rev. Jens Brøndum," April 10, 1973, cited in Dekar, *Creating the Beloved Community*, 141, 306n184.

political, and social forces that constitute the march of history."[582] Hassler's mission for Dai Dong, therefore, was to save humanity from itself, to re-direct history's global trajectory, to transpose human systems for greater alignment with natural systems and, consequently, to achieve greater equality and security for all passengers on Spaceship Earth.

Through Dai Dong, Hassler helped pioneer that new global environmental vision in the late 1960s and early 1970s. But, like most utopian efforts, Dai Dong ultimately failed to accomplish its goals of a new global order. In Dai Dong's failure, we see initially the robust resiliency of an established global system of economic and environmental exploitation, and of North-South political intransigence to resist change. Yet, when comparing Dai Dong's strategy with Friends of the Earth, a more complex picture appears. Today, Friends of the Earth thrives as an influential force in both national and international environments because it worked within established global systems. Friends of the Earth operated within the structures of national sovereignty, while still working toward global nature preservation, conservation, and environmentally sustainable technology for economic development. Friends of the Earth's survival and expansion beyond the global environmental moment and into the twenty-first century reveals how our dynamic and sovereignty-based systems for political organization and economic growth can confront, accept, and even co-op challenges to its global order. The global system discarded Dai Dong but absorbed Friends of the Earth, so long as Friends of the Earth worked within it. The triumph and tragedy of Dai Dong was that it thought globally and also sought to act globally.

[582] Barry Commoner, *The Closing Circle: Nature, Man, and Technology* (New York: Knopf,

Friends of the Earth, however, and the Oi Committee, for that matter, thought globally but acted locally. This may be the greatest practical lesson Dai Dong has to offer for contemporary efforts of global environmental diplomacy.

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As a major participant in the outer ring of Stockholm's environmental circus, Dai Dong represented how some new international organizations both rose to prominence and struggled through the global environmental moment. Dai Dong captured worldwide attention with its systems-based message of transnational unity, best captured in the Menton Statement. Yet, in Stockholm, the inability of attendees of Dai Dong's Independent Conference on the Environment to transcend their ingrained political divisions reflected the similar splits between nations North and South within the official UNCHE—political divisions that still define much of international environmental politics today. At the dawn of global environmentalism in the late 1960s and early 1970s, Dai Dong's vision that global unity was necessary both for social equity and environmental survival failed to transcend the political realities of the period, which led ultimately to Dai Dong's disintegration. Other organizations, like Friends of the Earth, also worked as knowledge brokers of environmental knowledge and sought similar global environmental objectives as Dai Dong, but the international environmental organizations that survived beyond the conflicts apparent at Stockholm found different political tactics that were more realistic to the contexts of the existing social systems.

1971), 300.

Elsewhere in Stockholm's outer ring of environmental events, the politics of how best to understand the integration of social systems and environmental systems came into conflict. The next chapter addresses how two of the leading environmental scientists that helped create the global environmental moment—Barry Commoner and Paul R. Ehrlich—also contributed to the environmental circus in Stockholm.

Chapter 8

TITANS IN THE FORUM:
Commoner and Ehrlich in Stockholm

"Although the agenda, issues, and procedures have been laid down rather firmly by pre-convention actions … the real issues are *certain* to arise in Stockholm, for the city will be host to much more than the official conference in June."

— Barry Commoner, "Motherhood in Stockholm," *Harper's Magazine*, June 1972.

"Some confusion, political maneuvering and outright stupidity were to be expected. But … "First World" environmentalists and population planners perhaps now realize that, like it or not, questions of environmental sanity and population control in all nations – rich and poor – cannot be divorced from basic questions of peace and equity."

— Paul R. Ehrlich, "A Crying Need for Quiet Conferences," *Bulletin of the Atomic Scientists*, September 1972.

The outer rings of Stockholm's environmental circus in June 1972 included more than just Dai Dong's Independent Conference on the Environment. While national delegations met in the inner ring of the United Nations Conference on the Human Environment (UNCHE), another component of Stockholm's outer ring included a convocation of individuals and non-governmental organizations who met at what was called the Environment Forum. There, diverse actors expressed their own ideas about the instigating factors behind the global environmental crisis and the best means for saving Spaceship Earth. While the points of debate at the Environment Forum often differed in content from those within the UNCHE, the politics concerning the social aspects of environmental issues remained somewhat similar at both. This chapter's focus on two influential environmental scientists who attended the Environment Forum—Barry Commoner and Paul R. Ehrlich, both

famed biologists and rival environmental activists—offers a key example for how various environmental ideas clashed in Stockholm's outer ring in ways that reflected many of the same divisions at other events during Stockholm's environmental circus.

Some fifteen miles away from the politicians and bureaucrats at the official UNCHE, on the other side of Stockholm, the UN-sanctioned Environment Forum provided a semi-official convention for the numerous citizens, scientists, and newly formed environmental NGOs who had first brought the environmental crisis to the world's attention. But due to its poor funding and lack of structure, the Environment Forum became an uncontrolled space of heated debates for various players, including environmental activists, prominent scientists, a burgeoning international civil society, as well as for often-radical skeptics of the official UNCHE.

Barry Commoner stood among the most prominent of these critics at the Environment Forum. Similar to Alfred Hassler and Dai Dong, Commoner believed the UN conference was avoiding discussion of controversial but fundamental issues for the global environment—issues like ecocide in Vietnam, environmental justice in the Third World, and the need to reconsider national sovereignty in order to solve the planet's transnational environmental troubles. While Paul R. Ehrlich had his own skepticism about the UN conference, he arrived at them through the issue of overpopulation. These differences provided the fodder for Commoner and Ehrlich's clash in Stockholm. Even before the UNCHE and Environment Forum had begun, one journalist explained that, "like the sorcerer's apprentice, the [Environment]

Forum has developed a personality and will of its own. There may even be some trouble and goings-on."[583] Indeed, there would be.

By the summer of 1972, the increasingly acrimonious debate between Barry Commoner and Paul R. Ehrlich had reached a fever pitch. Their disagreement began over the causes of the global environmental crisis and, therefore, the means to its solution. But it eventually shaped Commoner and Ehrlich into scientific, political, and even personal rivals. While Ehrlich remained wedded to his belief that overpopulation was the primary cause of global environmental problems and thus needed immediate—possibly coercive—control, Commoner refused to acknowledge human reproduction as anything more than a social choice to be made by sovereign individuals. For Commoner, the exponential growth of intrusive modern technologies—not growing human populations—was the main culprit behind the increasing destruction of ecological systems. In opposition to Ehrlich's strict biological focus on population, Commoner argued that only by revising the social systems of political economies that governed invasive technologies could humanity solve global environmental problems. For Commoner, population control remained an environmental red herring.

This chapter, like the prior one, aims to expand our understanding of the global environmental moment and how it climaxed in Stockholm. Doing so again requires stepping back in time to examine the origins of Commoner and Ehrlich's debate in the late 1960s before the events that unfolded in Stockholm in the summer of 1972. By the time Commoner and Ehrlich arrived in Stockholm to attend the

[583] Stanley Johnson, "Stockholm 1972," *The New Statesman* (June 2, 1972), 742.

Environment Forum, Commoner and Ehrlich had become enemies. At the peak of the global environmental moment, both Ehrlich and Commoner traveled to Stockholm in hopes of advancing arguments in their on-going debate before a worldwide audience. Though both men worked hard to promote awareness and achieve solutions for the global environmental crisis, Commoner and Ehrlich had become opposing gladiators, fighting one another for the heart and soul of the environmental movement, both with contending visions of very different futures—for people and for the planet. In Stockholm, they brought with them their battle for the soul of environmentalism, and they put it on a global stage.

Though prior scholars have examined the Commoner-Ehrlich debate, too little attention has focused on the important global contexts in which Commoner and Ehrlich argued, particularly for the planetary politics at play amid the apex of their debate in Stockholm. If at all, Commoner and Ehrlich's experience in Stockholm barely registers a sentence or two. Instead, most scholarly treatments limit the Commoner-Ehrlich debate only to its domestic context and emphasize its connotations for the historical and philosophical evolution of North American environmentalism.[584] Such a limited domestic view of their conflict, however, skews the history and the content of their debate. This chapter's focus on the international

[584] Thomas Robertson, *The Malthusian Moment: Global Population Growth and the Birth of American Environmentalism* (New Brunswich, NJ: Rutgers University Press, 2012), 181-184; Michael Egan, *Barry Commoner and the Science of Survival: The Remaking of American Environmentalism* (Cambridge, MA: MIT Press, 2007), especially Chapter 4: "When Scientists Disagree," 109-138; Andrew Feenberg, *Questioning Technology* (New York, Routledge, 1999), especially Chapter 3: "Environmentalism and the Politics of Technology," 45-71; Andrew Feenberg, "The Commoner-Ehrlich Debate: Environmentalism and the Politics of Survival," in *Minding Nature: The Philosophers of Ecology*, edited by David Macauley (New York: The Guilford Press, 1996), 257-282; Jeffrey C. Ellis, "On the Search for a Root Cause: Essentialist Tendencies in Environmental

dimensions of the Commoner-Ehrlich debate helps shed light on why the debate became so heated between the two environmental icons, as well as why it exploded in 1972 both before and during Stockholm's environmental circus.

In Stockholm, the Commoner-Ehrlich debate became not only a conflict between leading experts over the *science* behind the environmental crisis; it evolved into a much deeper conflict over human values, fundamental freedoms, and social justice. Because of its global setting during the Stockholm Conference, Commoner and Ehrlich's environmental argument transformed into a dispute over an individuals' right to control their own reproduction, about issues of equity and the structure of global political economy, as well as about national sovereignty and the economic self-determination of nations in the global South. Due to the interconnected complexities of global environmental challenges, Commoner and Ehrlich's debate transformed from a conflict over issues of science to a conflict over issues of politics. It eventually hinged on whether the world's recently decolonized nations could confront the environmental crisis on their own terms, without interference or domination from the wealthy, former-imperial nations of the global North.

Commoner's Worldviews

Between 1968, when Sweden first proposed and offered to host the UNCHE, and the summer of 1972, when the UNCHE and the Environment Forum occurred, concerns about the planet's environmental crisis inspired dark questions about the

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Discourse," in *Uncommon Ground: Rethinking the Human Place in Nature*, edited by William

future of human civilization, particularly for many of the advanced industrialized nations. By 1972, for many citizens and for some policy-makers, their sudden realization of a global environmental crisis meant that run-away pollution; poisoned food, waters and soil; the escalating loss of habitat and biodiversity; dwindling resources; and human overpopulation—all dilemmas still with us today—were conspiring apocalyptically to threaten the very survival of human life on Earth. Both Commoner and Ehrlich had played major roles bringing these concerns to public attention, particularly in the United States.

Commoner, a plant physiologist at Washington University in St. Louis and a seasoned activist in the science information movement against nuclear weapons, began his activism on behalf of the environment early in the 1960s, as noted in Chapter 2. Throughout the 1960s, Commoner earned widespread respect and popular appeal from both the American public and the scientific community. By the end of the 1960s, Commoner's ideas about environmental destruction honed in on the social effects of technology and how power was distributed and reified in society. As a result, Commoner's views about the environment became inseparable from his political considerations.

In Commoner's view, the recently recognized environmental defects of the day, particularly pollution, were the direct results of modern, anti-ecological technology and the systems of political economy that supported and controlled those technologies. Corrections to the environment, Commoner explained, would have no substantive impact without the sweeping restructuring of industrial, political, and

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Cronon (New York: W.W. Norton & Co., 1996), 256-268.

social priorities along more ecological lines. At the first Earth Day on April 22, 1970, Commoner declared, "the environmental crisis, together with all of the other evils that blight the nation—racial inequality, hunger, poverty, and war—cry out for a profound revision in our national priorities."[585] Not unlike the holistic vision of Dai Dong, though without their neo-Malthusianism, Commoner believed environmental issues were deeply interconnected with the world's great social, political, and economic problems. Commoner further developed and publicized his views in numerous lectures, articles, and book publications throughout the global environmental moment.[586] Commoner's activism even landed him on the cover of *TIME* magazine as the face, for many, of the scientific environmental movement.[587]

In these publications and through his work in the Scientists' Institute for Public Information, Commoner revealed a tightly held belief that the day's major issues of concern, from nuclear weapons to environmental degradation, were social issues that must be freely debated and ultimately decided by an informed and democratic public. Commoner was convinced that solving essential problems like the atomic threat and the environmental crisis, problems with such widespread impact on the lives of so many, must not be the decisions of the few who held political or economic power. Commoner believed that such decisions, either about building and testing nuclear weapons or about the use of certain polluting

[585] Barry Commoner, Untitled talk, Brown University, April 22, 1971, Box 131, Papers of Barry Commoner, Library of Congress Manuscript Division, Washington, DC.

[586] For his major publications at this time, see Barry Commoner, *Science and Survival* (New York: Viking Press, 1966); Barry Commoner, *The Closing Circle: Nature, Man, and Technology* (New York: Knopf, 1971).

[587] *TIME* Magazine, cover, February 2, 1970. See also the deluge of personal mail for Commoner in the wake of this article, nearly all youth who wondered how they could contribute to the

technologies, were social issues that the general public should decide. That public, in turn, must be informed adequately to make proper decisions on such profound issues, particularly when the issues involved matters of complex science. If scientists disagreed, Commoner believed their moral duty demanded making their debate public, both to enable a public form of expert peer review to occur openly and to allow for the public to weigh in on the social and political issues involved in the debate.[588]

For Commoner, the free expression of ideas and open debate were essential steps both to the greater empowerment of people and to remedying the technological problems at fault for the increasingly polluted environment. As he had stated at the Airlie House conference on Ecology and International Development in 1968, Commoner celebrated public controversy between scientists as the means for determining scientific truth. "We [scientists] get at truth not because we don't make mistakes," he explained, "but because we make our mistakes in public so that they can be corrected. And this is why controversy is essential. … Controversy should be encouraged."[589] His deeply held beliefs fueled Commoner's tireless campaign to promote and save the environment and to challenge those who held views different from his own. Of course, not everyone agreed with his interpretations on the

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environmental movement as the impending Earth Day activities, in Box 212, Papers of Barry Commoner, Library of Congress Manuscript Division, Washington, DC.

[588] Michael Egan, *Barry Commoner and the Science of Survival: The Remaking of American Environmentalism* (Cambridge, MA: MIT Press, 2007), Chapter 4: "When Scientists Disagree," 109-138.

[589] Commoner quoted in *The Careless Technology: Ecology and International Development*, *Record of the Conference on the Ecological Aspects of International Development Convened by The Conservation Foundation and the Center for the Biology of Natural Systems*, *December 8-11, 1968, Airlie House, Warrenton, Virginia*, edited by M. Taghi Farvar and John P. Milton (Garden City, NY: The Natural History Press, 1972), 548.

essential causes of the environmental crisis. Nor was Commoner alone in his public activism.

Ehrlich's Worldviews

As a prominent Stanford University biologist who helped discover the process of coevolution in 1964, Paul Ehrlich also had a long history of interest and concern about nature.[590] His concerns soon became exceedingly public. Ehrlich's controversial 1968 book, *The Population Bomb*, co-written with his wife Anne Ehrlich, breathed new life into timeworn, Malthusian fears of population growth. Commissioned by then-Sierra Club president David Brower after hearing Ehrlich give a rousing talk on the subject, *The Population Bomb* railed against explosive human population growth and the ensuing consumption of limited resources that rising populations demanded. After visiting India and experiencing its swarming mass of humanity in the mid-1960s, Ehrlich eventually concluded of all environmental problems that "Too many cars, too many factories, too much detergent, too much pesticide, … too little water, [and even] too much carbon dioxide – all can be traced easily to *too many people.*"[591] For an American public increasingly aware and uneasy about environmental dilemmas, *The Population*

[590] Paul R. Ehrlich and Peter Raven, "Butterflies and Plants: A Study in Coevolution," *Evolution* 18 (1964), 586-608; Paul R. Ehrlich, *The Machinery of Nature* (New York: Simon & Schuster, 1986), 145-146. See also Rae Goodell, *The Visible Scientists* (Boston: Little, Brown, and Co., 1977), 12.

[591] Paul R. Ehrlich, *The Population Bomb*, (New York: Ballantine Books and the Sierra Club, 1968), 66-67.

Bomb became one of the best-selling environmental books of all time, with three million copies in paperback by the mid-1970s.[592]

Ehrlich believed that humanity's increasing numbers would soon crash against the world's finite limits—a problem that demanded drastic solutions. In light of the American moon-landing in 1969, Ehrlich explained how "The Earth is a spaceship of limited carrying capacity," and attempts by humanity to stretch that limited capacity could only end with catastrophe.[593] In numerous essays, public lectures, interviews to publications from *Mademoiselle* to *Playboy*, and in repeat appearances on *The Tonight Show* with Johnny Carson, Ehrlich's message remained both consistent and drastic. He insisted that we either "find a way to bring the birth rate down or the death rate will soon go back up."[594] As an ideal solution, Ehrlich encouraged zero population growth, even negative population growth. In the spring of 1970, Ehrlich explained, "you try the least coercive and least obnoxious step first…and move gradually towards whatever is necessary to control the population." If voluntary methods did not curb the growth, he called for coercive, compulsory methods of population control, including forced abortions and sterilizations.[595] Not

[592] McCormick, *The Global Environmental Movement*, 84. For excellent analyses of Paul Ehrlich's views on population and the environment, see Thomas Robertson, *The Malthusian Moment: Global Population Growth and the Birth of American Environmentalism* (New Brunswich, NJ: Rutgers University Press, 2012); Paul Sabin, *The Bet: Paul Ehrlich, Julian Simon, and Our Gamble over Earth's Future* (New Haven: Yale University Press, 2013).

[593] Ehrlich, "The Population Explosion: Facts and Fiction," paper delivered at the 13th National Conference of the U.S. National Commission for UNESCO, "Man and His Environment: A View Toward Survival," November, 1969. Printed in the anthology of papers, Huey D. Johnson, ed., No Deposit – No Return (Reading, MA: Addison-Wesley Publishing Co., 1970), 36.

[594] "An Interview with Ecologist Paul Ehrlich," *Mademoiselle* Magazine (April 1970); "Playboy Interview: Dr. Paul Ehrlich," *Playboy* Magazine (August 1970); Paul R. Ehrlich, "The Population Explosion: Facts and Fiction," 37. See also Ehrlich's vast commitments to public addresses in Paul and Anne Ehrlich Papers (SC223), Special Collections and University Archives, Stanford University, Stanford, CA.

[595] Ehrlich, *The Population Bomb*, 118, 6.

one to mince words or miss a dramatic opportunity, Ehrlich continued, "Remember that the alternative to controlling the population is that all your kids die."[596]

Garrett Hardin, also a California-based biologist and advocate of population-control, concurred. In his widely read essay, "Tragedy of the Commons"—first published in 1968, like Ehrlich's *Population Bomb*, and reprinted repeatedly—Hardin expressed concerns similar to Ehrlich about unsustainable population growth on a finite Earth. Hardin recommended that control of breeding should best be considered as "mutual coercion, mutually agreed upon by the majority of people affected." He equated such mutually agreed upon coercion as akin to legal codes that limited the freedom of people to steal from one another.[597] According to Ehrlich and Hardin, imagined laws to coercively limit population would not restrict freedom; they would help ensure *increased* freedom and protection for people, just like laws against theft. The other option, Ehrlich dramatically maintained, was death. "Rather than have everyone die," Ehrlich explained, "we will limit the number of births."[598]

The issue of overpopulation was not merely a localized problem for Ehrlich and Hardin, nor one that only threatened humans. Ehrlich's biological worldview revealed to him and his many followers that unlimited and exponential growth in human population threatened the entire global environment. "It is fair to say," he said, "that the environment of every organism, human and nonhuman, on the face of

[596] Paul Ehrlich, interviewed by Canadian Broadcasting Corporation (CBC) producer Bill Terry on March 6, 1970, "Population, Food, and Resources," in *Balance and Biosphere: A Radio Symposium on the Environmental Crisis* (Toronto: The Hunter Rose Company, 1971), 69.

[597] Garrett Hardin, "The Tragedy of the Commons," *Science* 162:3859 (December 13, 1968), 1247. While originally delivered as a presidential address to the Pacific Division of the American Association for the Advancement of Science late in 1967, Hardin published his now infamous essay in December 1968, a few months after publication of Ehrlich's *The Population Bomb*.

[598] Ehrlich, CBC interview, "Population, Food, and Resources," 65.

the Earth has been influenced by the population explosion of *Homo sapiens*."[599] Indicating the international nature of the population problem, Ehrlich concluded that the United States government must therefore "adopt some very tough foreign policy decisions."[600] Both Ehrlich and Hardin eventually concluded that, given the dire nature of overpopulation, international aid and humanitarian interventions became unethical.

Initially, Ehrlich and Hardin both argued that food aid and economic assistance from wealthy nations to overpopulated nations, even those suffering from famine, must cease. Sending food, Hardin argued, was actually the worst way to help a foreign country escape overpopulation. "Atomic bombs would be kinder," he wrote. Those starving populations had already outstripped the carrying capacity of their land, and humanitarian aid would only exacerbate the planet's problems. By receiving food aid, people who would have starved to death normally would now survive to reproduce, which further exacerbated population growth and future famines, as well as anthropogenic environmental damage. "For a few moments," Hardin predicted, "the misery would be acute, but it would soon come to an end for most of the people, leaving a very few survivors to suffer thereafter."[601] By their hard logic of population control, selfishness became wealthy governments' only ethical option for the protection of global ecological systems from the poor decisions and bad habits of foreigners.

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[599] Ehrlich, *The Population Bomb*, 39.
[600] Ehrlich, *The Population Bomb*, 121.
[601] Garret Hardin, "The Survival of Nations and Civilization," *Science* 172:3990 (June 25, 1971): 1297. See also Garrett Hardin, "The Immorality of Being Softhearted," *The Relevant Scientist* 1 (November 1971), 17-18; Ehrlich, *The Population Bomb*, 161.

Initial Contact and Conflict between Commoner and Ehrlich

Both Barry Commoner and Paul Ehrlich came separately to their different interpretations about the causes and solutions to the global environmental crisis. By 1969, however, their relentless activism in announcing the planet's perils made both men leading figures in the burgeoning environmental revolution, particular in the United States. Increased environmental concerns in the United States spawned rapid growth of an environmental movement that looked beyond its domestic borders to consider the planetary effects of harming nature.[602] As a result, the U.S. National Commission for UNESCO selected as the subject for its annual conference, "Man and His Environment: A View Toward Survival," held in San Francisco in November 1969. Given the eventual global contexts of Commoner and Ehrlich's opposing interpretations of the environmental crisis, it seems fitting that this UN-related conference first sparked their public disagreements over the world's gravest environmental challenges.

In his talk on the "Ecological Facts of Life," Commoner argued that ecological destruction was "an intrinsic feature of the very technology which we have developed to enhance productivity."[603] Commoner offered not merely with scientific but also political advice. In order to save the earth from human action, "The most grave social judgments must be made." Commoner devoutly believed such decisions must be public ones as they would have such a powerful impact on

[602] See Chapter 3. See also Gladwin Hill, "Environment May Eclipse Vietnam as College Issue," *New York Times* (November, 30, 1969), pg 1; Anthony Lewis, "Not a Bang but a Gasp," *New York Times* (December 15, 1969), pg 46.

society. In order to make these judgments and to "organize the vast restorative program, the public will need to have the relevant facts in understandable terms."[604] Such was the duty, Commoner believed, of scientists like himself at conferences like the one he addressed.

Ehrlich delivered the next lecture, titled "The Population Explosion: Facts and Fiction." In a direct challenge to Commoner's holistic approach to alter the social and environmental quality of life, Ehrlich concluded that the "problems of the quantity of life must have priority." Ehrlich proclaimed, "it is unlikely that even the sorely needed, enlightened technology could support three and half billion people for long at a decent level of living without irreversibly harm to the environment."[605] Like Commoner, Ehrlich advocated major changes in economic and social policy, but unless global population problems were confronted head-on, such social and political changes were futile. He insisted, "We must divert attention from the treatment of symptoms of the population explosion and start treating its cause."[606] Ehrlich admitted a need to "switch from the present 'Cowboy Economy,' emphasizing planned obsolescence, exploitation for short-term gain, and waste, to a 'Spaceman Economy,' emphasizing recycling and the preservation of the planetary life-support systems."[607] Yet, he maintained that this switch *must* be accompanied by immediate policies for domestic and international population control. No time remained for the public to make such decisions, and, according to Ehrlich, "Anyone

[603] Commoner, "The Ecological Facts of Life," 33-34.
[604] Commoner, "The Ecological Facts of Life," 35.
[605] Ehrlich, "The Population Explosion: Facts and Fiction," 37.
[606] Ehrlich, "The Population Explosion: Facts and Fiction," 43.
[607] Ehrlich, "The Population Explosion: Facts and Fiction," 44.

who stands in the way of measures to bring down the birth rate is automatically working for a rise in the death rate."[608] Commoner not only believed Ehrlich was scientifically wrong about the population problem, he considered Ehrlich's inability to acknowledge social factors in biological and environmental issues to be morally reprehensible.

Commoner experience at this UNESCO meeting fueled his personal crusade to discredit Ehrlich's population thesis. Over the next few years, Commoner's beliefs on the environmental crisis and fears about population control became further cemented in his own original focus on eliminating polluting technologies and the need for massive social and political restructuring. Commoner's fears about Ehrlich's views ultimately led to Commoner's inability to even acknowledge population pressures as a legitimate environmental concern. Commoner and Ehrlich's meeting at the U.S. commission's UNESCO Conference sparked a major scientific debate that eventually played itself out in the public eye, with consequences both for the American and global environmental movements.

In March 1970, the following spring, Commoner and Ehrlich's debate escalated beyond differing scientific viewpoints to become a personal confrontation. Shortly after Ehrlich and Commoner's initial meeting at the U.S. Commission's UNESCO conference, Bernard Berelson, the president of the Population Council in New York City, invited several scientists, including Barry Commoner, to meet in his office in hopes of reaching a consensus on population policy in the United States.[609]

[608] Ehrlich, "The Population Explosion: Facts and Fiction," 37.

[609] "Scientific Foundations of Population Policy with Particular Attention to Population Growth and Distribution in the United States—Notes on a Meeting Organized by the Population Council

While Ehrlich could not attend the meeting, Ehrlich's good friend and occasional writing partner from UC Berkeley, John Holdren, did. According to Holdren, a physicist at Lawrence Livermore Laboratory and population control advocate, Commoner took the opportunity at the Population Council meeting to launch a "tirade" against Ehrlich, accusing the absent scientist of harboring population philosophies that were "improper morally" as well as "politically coercive and totalitarian."[610] Word of Commoner's accusations returned to Ehrlich, resulting in deeper strain between the two scientists.

At Commoner's initiative, he and Ehrlich finally crossed paths again late in December 1970, a few months after the first Earth Day's massive outpouring of environmental action and just as the UN initiated serious strides toward planning the UNCHE in Stockholm. Commoner organized a symposium specifically on the role of population growth designed to elicit their opposing views at the 137th annual meeting of the American Association for the Advancement of Science (AAAS) in Chicago. For the panel, Commoner invited Ehrlich, Garrett Hardin, and demographer Ansley Cole. Ehrlich and Garrett Hardin again pushed a view toward taming wild population growth as fundamental to environmental preservation. Over the prior year, Commoner had become even stauncher in his belief that environmental problems did not come from population but resulted from the polluting technology of industrialized political economies. Commoner saw the

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March 6-7, 1970 and attended by demographers, ecologists, biologists, and physical scientists," draft notes prepared by W. Parker Maudlin, March 23, 1970, Box 215, Papers of Barry Commoner, Library of Congress Manuscript Division, Washington, DC.

[610] Holdren quoted in Constance Holden, "Ehrlich versus Commoner: An Environmental Fallout," *Science* 177:4045 (July 21, 1972), 245.

challenge of exploding populations not in biological terms, as Ehrlich and Hardin did, but as something to be resolved by reorganizing social and political systems, and those systems ways of using technology. As anticipated and duly covered by major media coverage of the AAAS symposium, Commoner offered impassioned opposition to Ehrlich's views. Commoner boldly stated, "There is no ecological population problem….The issue is the nature of our technology and not the size of our population."[611] Neither seemed willing to concede or even collaborate with the other. Reporters found the debate confusing and acrimonious. One writer recalled, "they were screaming at each other."[612]

Ehrlich and Commoner's extended debate continued to earn major coverage in the media. *TIME* magazine described the encounter as one between dreary environmentalists who "violently disagree" over basic causes and cures, locked in "vociferous" opposition. *TIME* also took note of the political challenges that either population control or technological changes might cause. As populations rose, that "removes citizens further from decisions made by their leaders." Yet, as Commoner argued, coercive control of population limited individual freedom. *TIME* labeled the Ehrlich and Commoner's view of the future as "potentially hideous," particularly because "democracy can lose meaning."[613] When taken to a global level, where individual representation was already further removed, these opposing issues became even more dire.

[611] Commoner quoted in "AAAS: Conflict, Confrontation, Consideration," *Science News* 99:2 (Jan. 9, 1971), 21.
[612] Rae Goodell, *The Visible Scientists* (Boston: Little, Brown, and Co., 1977), 25.
[613] "A Clash of Gloomy Prophets," *Time,* January 11, 1971.

Just when the world most needed wise direction on environmental issues with implications of deep political and personal importance, it seemed as though the nascent environmental movement was fracturing. Increasingly, both Commoner and Ehrlich appeared in the public eye as "prophets of doom." Other times described as "the New Jeremiahs," their debate nonetheless helped promote a more wide-ranging awareness and discussion about the causes and nature of crisis in the global environmental moment.[614] While Commoner and Ehrlich fought for the heart of environmentalism, governments of the world also began to organize for ways to define and confront global environmental challenges.

Commoner and Ehrlich in International Contexts

In the early 1970s, as the debate between Commoner and Ehrlich became increasingly caustic, the planning process for the upcoming UNCHE evolved into a conflict over environment versus development. At the UN, industrialized nations called for global attention to problems of environmental decline while developing nations demanded on-going efforts to escalate their industrial development.[615] That conflict reflected the elements of Ehrlich and Commoner's debate when viewed through the frame of coercive change for population control versus individual freedom to select one's own methods of economic improvement and environmental reform. Ehrlich's initial argument to enforce population control, both at home and abroad, helped inspire the fears of developing nations who sought to retain their national sovereignty. Commoner's faith in letting the public make its own decisions

[614] McCormick, *The Global Environmental Movement*, 84-88.

of such social and political importance served to quell some of those fears, yet his arguments about the environmental crisis were no safe route for the developing world either. Countries in the developing world desired the very industrial technologies that Commoner chastised for disrupting nature's replenishing ecological cycles. Both scientists' viewpoints posed problems for the developing world —either as a challenge to their hope for increased development of industrial technologies, or as a challenge to those nations' sovereignty, particularly if global population restrictions were enacted.

Throughout the early 1970s, as the preparations continued for the UNCHE, Ehrlich and Commoner's debate came to incorporate elements of that global dialogue. Both Commoner and Ehrlich's public advocacy about the environmental crisis became both more widespread yet also more nuanced to reflect a greater understanding of the global picture.[616] For instance, after its wild success when published in 1968, Ehrlich revised *The Population Bomb* in 1971. Possibly due to his continued conflict with Commoner, Ehrlich's views on population slowly became less sharp and more globally aware of other environmental issues beyond overpopulation.

In Ehrlich's new edition, his Prologue still emphasized the primary importance of population in environmental crises, but he removed from the newer version the last sentence from his earlier prologue that "Population control is the only answer." Critics like Commoner and others who advocated on behalf of the

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[615] See Chapters 4 and 5.

[616] For one example of Ehrlich's popular and global advocacy, see Paul Ehrlich, "World Population: Is the Battle Lost?" *Reader's Digest* (February 1969), 137-140.

global South had decried Ehrlich as a racist and neocolonialist for his demeaning and harrowing description of a slum in Delhi, India. In his new version, Ehrlich removed the sentence, "since that night I've known the *feel* of overpopulation," and he replaced it with reflections about the global and interconnected nature of environmental problems. The new version now explained that "the problems of Delhi and Calcutta are our problems too. Americans have helped to create them; we help to prevent their solution. We must all learn to identify with the plight of our less fortunate fellows on Spaceship Earth if we are to help both them and ourselves to survive." Ehrlich also deleted from the new edition his prior policy suggestion that food should be withheld from countries like India if they were not doing enough to combat the threats of famine and death from their rampant population growth.[617] Slowly, by 1971, Ehrlich's advocacy on overpopulation began to acknowledge both international political realities and the moral implications of his recommendations.

Also in 1971, Commoner published his own best-selling environmental book, *The Closing Circle*, which placed his own arguments against Ehrlich in a global context that integrated environmental issues with politics and history. Commoner's book expressed clearly his conviction that population problems in the developing world were a direct result of prior colonial exploitation by imperial, industrialized nations and the resulting unequal distribution of wealth. This, in turn, had negative

[617] Rae Goodell, *The Visible Scientists* (Boston: Little, Brown, and Co., 1977), 15-25. For changes in the different editions, see Paul R. Ehrlich, *The Population Bomb*, (New York: Ballantine Books and the Sierra Club, 1968), 15-16, and Paul R. Ehrlich, *The Population Bomb*, (New York: Buccaneer Books, 1971), 1-2.

environmental effects, albeit not as damaging as polluting technologies.[618] Commoner believed that the demographic transition, a development in which death rates and birth rates in a population both declined as wealth and education increased from the processes of industrialization, did not occur in the developing world due to the processes of imperialism. Commoner argued that the wealth extracted from less developed colonies of the global South by the imperial nations of the global North contributed to a demographic transition only for the now-wealthy colonizing nations. The industrialized nations thus left the underdeveloped, exploited colonial nations without sufficient internal markets in order to effect their own demographic transition. The poorer nations of the global South benefited physically from the technologies that reduced their death rates, like modern medicines and agricultural technologies, but they did not benefit from the commercially generated higher standards of living associated with reductions in birth rates. Rather than declining, Commoner believed, the populations in less developed nations thus tended to rise. As a result, Commoner concluded that "Both the environmental *and* population crises are the largely unintended result of the exploitation of technological, economic, and political power." Their solutions, therefore, "must also be found in this same difficult arena."[619] Commoner believed the only ways to effect significant change to these separate crises was not just to correct faulty technology but to radically reorganize global political economies for a greater distribution of wealth.

[618] Commoner, *The Closing Circle,* 237-249. Commoner took this interpretation of world population from the work of Nathan Keyfitz and Clifford Geertz. See, Nathan Keyfitz, "National Populations and the Technological Watershed," *Journal of Social Issues* 23 (1967), 62-78; and, Clifford Geertz, *Agricultural Involution* (Berkeley: University of California Press, 1963). See also, Egan, *Barry Commoner and the Science of Survival*, 122-123.

Shortly before the UNCHE began in Stockholm, Commoner wrote in *Harper's Magazine* and described the environmental crisis as a global concern. He also annunciated his increasingly radical views on how to properly correct the crisis. Commoner described Stockholm as a place where "ecological crusaders are about to clash with seekers of social justice," and he denounced what he called "conventional wisdom" about environmental problems. [620] Three mostly misleading concerns, he believed, would likely be voiced in Stockholm: concern about rising population, played out in the form of "whites versus non-whites"; debate over demand and consumption of limited natural resources, which he framed as "haves versus have-nots"; and, the "harmful help" in the form of industrial technologies meant to aid the global South, which simply promoted pollution and environmental damage.[621] All of these issues, Commoner highlighted, exacerbated the divides between industrialized and less developed nations, yet in his eyes, most missed the real crux of the matter.

To solve the real issues of global environmental concern, Commoner announced, one must recognize that the source of the environmental crisis actually lay in "certain very specific changes in the ways goods are produced, which are themselves governed by powerful economic and political considerations."[622] In order for the UNCHE or other gatherings in Stockholm to address those "real" problems, Commoner believed the world must first recognize that the "origins of the environmental crisis" came from "economic inequalities, within nations and among

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[619] Commoner, *The Closing Circle*, 247.
[620] Barry Commoner, "Motherhood in Stockholm," *Harper's Magazine* 244:1465 (June 1972), 49-54.
[621] Commoner, "Motherhood in Stockholm," 49-50.
[622] Commoner, "Motherhood in Stockholm," 53.

them, in militarism, and in cultural patterns."[623] As such, many nations from the developing world might have seen Commoner's analysis and demands aligned with their own desires for greater economic development.

Yet, Commoner's argument differed in significant ways from many developing nations seeking development. Commoner advocated against reproducing the old ways of economic industrialization. Global survival, Commoner advised, demanded that the "economic principles" that governed all human productive activities "must obey…ecological imperatives."[624] That not only meant a complete transformation in the ways that global goods were produced and transported, more importantly, it meant a total revolution in the geopolitical and economic world order. When Paul Sears described ecology as "a subversive subject" as early as 1964, Barry Commoner took it very seriously.[625]

Over the course of his debate with Commoner and in light of the upcoming UNCHE, Ehrlich's ideas about the environmental crisis continued to evolve and expand. Initially, however, Ehrlich kept a cool distance from the preparations for Stockholm. In the summer of 1971, he admitted having "heard with some interest of the 'World Conference on the Human Environment' to be held in Stockholm" the next June. After the release of the UNCHE draft Declaration and draft Action Plan proposals, Ehrlich received an anxious letter from an environmental advocate in the Netherlands concerned about rising populations. The Dutchman was astounded that the planned UN program included "no mention of the basic problem of unrestricted

[623] Commoner, "Motherhood in Stockholm," 54.
[624] Commoner, "Motherhood in Stockholm," 53.

human reproduction."[626] Indeed, in the thousands of pages of UN materials produced for the UNCHE, only two minor recommendations addressed population.[627] The UN conference's Preparatory Committee—dominated by less developed nations like Brazil—had argued successfully that population was too touchy a subject to introduce in the world's first attempt to find common ground on environmental issues. As late as August 1971, Ehrlich replied he had not been invited and therefore was not planning to go to Stockholm. Nor, Ehrlich continued, would he attempt to "be of much help" in raising the question of "unrestricted human reproduction" at the conference. "As it seems that the conference may have a very political orientation," Ehrlich incorrectly presumed, "it might be that my presence might not be of much use."[628]

By January 1972, however, Ehrlich's interest and involvement in the environmental activities planning for Stockholm increased, partially inspired by his continuing debate with Commoner. Early that January, Ehrlich received an invitation from Ronald Eber, a Sierra Club representative and committee coordinator for a series of meetings throughout North America to stimulate awareness of international environmental problems and some of the issues to be raised at the UNCHE. Eber,

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[625] Paul Sears cited in Peter R. Hay, *Main Currents in Western Environmental Thought* (Bloomington and Indianapolis: Indiana University Press, 2002), 131.

[626] M. van der Goes van Naters to Paul R. Ehrlich, July 29, 1971, Folder 35 [1972 United Nations Conference on the Human Environment, Stockholm, Folder 1 of 2], Box 1, Series 5, Paul and Anne Ehrlich Papers, Special Collections and University Archives, Stanford University, Stanford, CA. M. van der Goes van Naters was a member of the International Union of the Conservation of Nature and Natural Resources and chairman of what he described as the "top-organization of the Netherlands Nature Protection."

[627] Rowland, *The Plot to Save the World*, 126.

[628] Paul R. Ehrlich to M. van der Goes van Naters, August 3, 1971, Folder 35 [1972 United Nations Conference on the Human Environment, Stockholm, Folder 1 of 2], Box 1, Series 5, Paul and

obviously aware of the rising tensions between Ehrlich and Commoner, handwrote at the end of his typed invitation, "Common has been active – chance to counter."[629] Ehrlich, who had become increasingly obsessed with his ongoing debate with Commoner, quickly agreed to deliver the keynote address in early February. It would occur at a San Francisco meeting on the topic of "Ecology and Third World Development." Ehrlich's distant interest in the conference shifted as a result both of the preparatory processes and his desire to challenge Commoner's interpretation of environmental threats.

Ehrlich's keynote address on Ecology and Third World Development announced a great deal of skepticism about the upcoming UNCHE in Stockholm. First, he feared it would merely be a convention full of "establishment representatives" praising each other's governments for saving the environment when "virtually all governments are promoting environmental destruction." Secondly, Ehrlich was shocked at the "nearly total absence of consideration of population problems from the Conference's agenda," which he attributed to "the overriding tendency of UN member nations to put the personal interests of their political leaders and governments before those of the world's people." While still maintaining a focus on population issues, Ehrlich then turned to the topic of the third world and, surprisingly, argued many of the same points Barry Commoner might have outlined. Nearly stealing Commoner's words, Ehrlich explained how the world ecology

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Anne Ehrlich Papers, Special Collections and University Archives, Stanford University, Stanford, CA.

[629] Ronald Eber to Paul R. Ehrlich, January 4, 1971, Folder 13 [Berkeley Ecology and Third World Development, 1972], Box 1, Series 5, Paul and Anne Ehrlich Papers, Special Collections and University Archives, Stanford University, Stanford, CA.

movement "has not paid enough attention to the critical problems of the redistribution of wealth and opportunity."[630] While clearly making some concessions to his overt focus only on overpopulation, Ehrlich still trafficked in neo-Malthusianism.

Ehrlich continued, describing the "three-pronged threat" facing the Third World: "growth of world population, absolute shortage of global resources, and misdistribution of those resources" which "all combine to keep them in poverty and raise the specter of world catastrophe." Ehrlich again raised the point that population growth among the world's affluent nations posed "a greater threat to the ecosphere than excess reproduction by the poor." Ehrlich, however, placed his new, nuanced analysis in a global context and concluded that, "overdeveloped nations, like the United States, the Soviet Union, Japan, Great Britain and Germany [must] halt their population growth and…alter their economic systems." Once those sweeping changes occurred, he claimed, the nations of the global South could then "move toward a kind of development not modeled on Western mistakes."[631] Ehrlich's views on the causes and solutions to environmental crisis on Spaceship Earth had had evolved as a result of his debate with Commoner and as part of the global environmental moment's rush toward Stockholm.

Nonetheless, Ehrlich emphasized that the third world must not be deceived into thinking that all problems lie in the overdeveloped nations of the global North.

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[630] Press Release on Ehrlich's keynote address to meeting on Ecology and Third World Development, February 4, 1972, Folder 13 [Berkeley Ecology and Third World Development, 1972], Box 1, Series 5, Paul and Anne Ehrlich Papers, Special Collections and University Archives, Stanford University, Stanford, CA.

[631] Press Release on Ehrlich's keynote address, February 4, 1972, pg 2.

"Rapidly growing populations" Ehrlich harped, and ongoing "problems of internal organization" still plagued the global South. Even if the world's goods and resources were "suddenly and miraculously equitably distributed and nothing else was changed," Ehrlich warned, "we would still have instant malnutrition world-wide and would continue down the path to ecocatastrophe." While he adapted much of Commoner's rhetoric, Ehrlich refused to abandon his own. Changes in economic and political systems were necessary, Ehrlich concluded, but "the problems of equity must be attacked simultaneously with the problems of population control."[632] From the perspective of nations in the developing world, many of which had recently decolonized from under the yoke of industrialized imperialism, Ehrlich's rhetoric may have been favorable to their desire for equal development opportunities. However, his views still appeared as a direct challenge to their national sovereignty.

Whereas Ehrlich's scientific analysis focused strictly on biological limits, Commoner emphasized the social construction scientific knowledge and recognized the embedded politics in seemingly scientific processes. Commoner believed that "The task of restoring the planet's ecological stability is vast, complex, and deeply rooted in economic, social, and political issues."[633] Commoner had already concluded that faulty industrial technology adopted since the end of WWII—especially the increased use of petroleum-based synthetic chemicals instead of natural products—was the primary cause of run-away pollution and environmental

[632] Press Release on Ehrlich's keynote address, February 4, 1972, pg 3-4.

[633] Barry Commoner, "The Ecological Facts of Life," paper delivered at the 13th National Conference of the U.S. National Commission for UNESCO, "Man and His Environment: A View Toward Survival," November, 1969. Printed in the anthology of papers, Huey D. Johnson, ed., *No Deposit – No Return* (Reading, MA: Addison-Wesley Publishing Co., 1970), 35.

degradation. This un-ecological technology had nothing to do with the number of people on the planet; it reflected deficient human choices driven by politics and profits, not biological processes.

Likewise, Commoner believed overpopulation was not the simple result of unchecked fertility; its roots lay in the socio-political conditions of global inequality, especially the conditions shaped historically by colonial processes that stunted a complete demographic transition in the global South. While Commoner acknowledged the dilemma of feeding a rising population on a finite planet, he differed drastically from Ehrlich in his scientific analysis and solution to it. In Commoner's historical and scientific examination, western medicine and colonial management had extended the survival rate of colonial peoples, but the transfer of natural resources and wealth from the colonial periphery to the hegemonic core maintained the economic need for families to have multiple children. For Commoner, global poverty and inequity caused overpopulation and environmental harm, not unbridled biological processes.

Much more than Ehrlich, Commoner's global environmental analysis included a social, political, and even moral component. Commoner concluded, "Thus, when any environmental issue is pursued to its origins, it reveals an inescapable truth—that the root cause of the crisis is not to be found in how men interact with nature, but in how they interact with each other—that, to solve the environmental crisis we must solve the problems of poverty, racial injustice and war; that the debt to nature which is the measure of the environmental crisis cannot be paid, person by person, in recycled bottles or ecologically sound habits, but in the

ancient coin of social justice; that, in sum, a peace among men must precede the peace with nature."[634] For Commoner, the global environment and humanity's social webs were inseparably interconnected. As he succinctly put it, Commoner believed of Ehrlich that "Ecologists should go back to the butterflies and leave human populations alone because social things characterize them."[635]

Commoner and Ehrlich's profound conflict over root causes and concomitant solutions brought these two environmental scientists to a public conflict that threatened to tear the burgeoning but young global environmental movement in two. Additionally, Ehrlich and Commoner's clash reflected, and perhaps even predicted, the global divisions between wealthy industrialized and poor underdeveloped nations over environmental matters. During preparations for the official UNCHE, the main debate between nations revolved around fears that industrialized countries and their citizens favored coercive environmental regulations to limit and freeze economic growth, creating a so-called space-man economy for all the passengers on Spaceship Earth. In response, the less developed nations of the global South declared their sovereign rights to economic development in order improve their peoples' impoverished living conditions, even at the expense of the global environment decline. Pollution, many said, was an environmental problem for the North to fix and pay for, while poverty remained the primary environmental problem of the South, which only development could cure. It was under these circumstances in the summer of 1972, that both men arrived in Stockholm to participate in UNCHE events,

[634] Barry Commoner, "Ecology and Social Action," March 15, 1973, *The Horace M. Albright Conservation Lectureship* (Berkeley, CA: UC School of Forestry and Conservation, 1973), 24.

especially at the Environment Forum, where they would proclaim the scientific and social righteousness of their views.

Another Outer Ring: Stockholm's Environment Forum

Throughout 1971 and 1972, as preparations for the UNCHE continued, newly influential non-governmental environmental organizations, both old and new, demanded a say in the widely publicized international conference. Partially as a reflection of Commoner and Ehrlich's acknowledgement of global environmental concerns, environmental organizations—including the Sierra Club, Friends of the Earth, International Planned Parenthood Federation, the Congress of African People, Socialist International, the World Wildlife Fund, the National Audubon Society, the International Chamber of Commerce, and many others—all sought some sort of involvement at Stockholm.[636] While they would not have much say over the inner ring of events in Stockholm, many of these groups arrived there to help create the outer rings of Stockholm's environmental circus.

The UN responded to this popular interest by suggesting that NGOs already associated with UNESCO, as well as "other NGOs of genuinely international character," should be invited to a separate in an NGO colloquium, provided they were "directly concerned with the subject matter of the Conference."[637] As a result,

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[635] Commoner quoted in Olivia Schieffelin Nordberg, "Population Study Begins to Interest Scientists from Anthropology to Economics to Ecology," *Population Chronicle* 7 (January 1972): 4.

[636] Francis Gendlin, "Voices from the Gallery," *Bulletin of the Atomic Scientists* (September 1972), 26-29.

[637] Strong quoted in "Chapter Two: Consultative Status for NGOs at the UN," in Peter Willetts, "*The Conscience of the World": The Influence of Non-Governmental Organizations in the UN System*, http://www.staff.city.ac.uk/p.willetts/NGOS/CONSSTAT.HTM, accessed March 12, 2009.

the Conference's Preparatory Committee made plans for a distinct gathering they called the Environment Forum—a separate, semi-official NGO conference in Stockholm that would run concurrently with the official UNCHE but he held several miles away from the inner ring of the UNCHE. In its original conception, Canadian journalist Wade Rowland explained the Environment Forum was to be a place where concerned individuals and NGOs could "air their views in the assembled presence of the world press." Its intended function, Rowland believed, was to act as "a kind of official conscience for the U.N. conference delegates."[638] It would offer a place for public education about global environmental concerns. In practice, however, the Environment Forum became a chaotic mix of mostly unorganized actors agreeing on little while declaring their own ideological views for saving Spaceship Earth.

Barry Commoner, who was unable to influence much of what happened in the UNCHE's inner ring, knew he had to become a part of things in Stockholm's outer ring. Commoner knew about the planning of the Environment Forum from his graduate student M. Taghi Farvar, who also planned to arrive in Stockholm along with members of his activist Oi Committee. Regardless of what was to happen on the floor of the official UNCHE, Commoner prophesized that, in Stockholm, "the delegates—and the world—are certain to be reminded that there is much more to the environment crisis that the [UNCHE's proposed] monitoring of pollutants, control of effluents, or tax incentives."[639] Commoner saw the Environment Forum as a place where his "real" causes and solutions for the environment could be addressed. It was there where Commoner planned to teach the ecology of social justice to the world. It

[638] Rowland, *The Plot to Save the World*, 121.

was there that he believed, "new steps could be taken toward making peace among men that must precede a peace with nature."[640] And, it was there that he would clash, indirectly, with his great rival, Paul Ehrlich.

The Environment Forum opened on June 5 1972, some fifteen miles away from the official UNCHE on the other side of Stockholm. The physical distance between the two conferences reflected the vast differences in how each was run and what they achieved. One observer of events at the Forum described the atmosphere inside as "charged with excitement and controversy." At some of the Forum's sessions, she recalled, over seven hundred NGO activists from around the world poured into a space designed for only five hundred, "filling the balcony, flowing out into the corridors which were already crowded with exhibits."[641] While the official UNCHE became highly regulated both in content and in terms of who could participate, the laissez faire attitude of the Swedish planning committee behind the Environment Forum allowed it to descend into a political free for all.

Barry Commoner arrived in Stockholm and discovered that the poor planning for the Environment Forum permitted him an opportunity help redirect its focus toward his personal interpretation of the environmental crisis. The Environment Forum did not structure its debates around a set of formal rules of procedure. As such, another observer later explained, "it left itself open to the possibility to being

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[639] Commoner, "Motherhood in Stockholm," 54.

[640] Barry Commoner, "Motherhood in Stockholm," *Harper's Magazine* 244:1465 (June 1972), 54.

[641] Gendlin, "Voices from the Gallery," 28.

dominated by almost any determined group or individual with an axe to grind." And this, the observer recalled, "was exactly what happened."[642]

Commoner opened the official sessions for the Forum along with the president of the International Center for Development, José de Castro, from Brazil. Their presentation clearly set the tone for what topics would dominate future sessions at the Forum. While Commoner opened and set the Forum's tone, it was his former graduate student, Taghi Farvar, and the Oi Committee who worked the floor of the conference to dominate the Forum's structure, information sessions, and discourse. Together, Farvar and Commoner teamed up to effectively dominate the agenda at the Forum and shape what eventually became its radical discourse, particularly against any NGOs or activists that espoused concern about population growth.

Conflict in the Forum

Before his own arrival into Stockholm, Paul Ehrlich had no knowledge of Commoner and Farvar's control over the Environment Forum. The Forum, he had hoped, "was the place where taboo subjects of population control, zero economic growth, redistribution of wealth, etc., could have been rationally and constructively discussed by individuals free from the rigid constraints within which official delegates had to operate."[643] As such, Ehrlich accepted Planned Parenthood International's invitation to appear on a panel addressing the opposing views

[642] Rowland, *The Plot to Save the World*, 128.
[643] Paul R. Ehrlich, "A Crying Need for Quiet Conferences: Personal Notes from Stockholm," *The Bulletin of the Atomic Scientists* (September 1972), 30.

between he and Commoner. Commoner, however, refused to participate in the panel. When Ehrlich nonetheless agreed to arrive in Stockholm for the panel, Commoner was ready. Commoner had spent the much of the two prior weeks in Stockholm giving numerous public lectures and essentially turning the NGO Environment Forum into a platform for own his views on the global environmental crisis—a view quite sympathetic to many participants at the Forum from the global South, especially those who identified with Farvar's Oi Committee.

Intimately aligned with Farvar's advisor Barry Commoner, the Oi Committee refused to count overpopulation as a viable environmental concern. Instead, at the Environment Forum just as they had at Dai Dong's Independent Conference, Farvar and other Oi members vehemently defended less developed nation's rights to sovereignty, encouraged revolutionary liberation from colonial economic frameworks, and demanded global redistribution of wealth as a means to mitigate environmental harm. Concerns about overpopulation, they declared, were part of a racist, neo-imperialist plot for Third World genocide, designed to keep mostly white peoples from industrialized nations at the top of the global economic food chain.[644]

On the day of Paul Ehrlich's presentation, Farvar and his Oi Committee effectively launched a coup. Ehrlich had arrived at the Forum for a program that was to begin with a press conference followed by his participation in a panel discussion on population to be chaired by Sir Peter Scott of the World Wildlife Fund, as well as a mix of demographers composed of Ehrlich, a Swede, a Kenyan, an Englishman,

[644] Rowland, *The Plot to Save the World*, 129.

and a Senegalese.[645] During the press conference, Ehrlich, clearly comfortable with public attention, answered one or two questions from audience with confidence, although his frequent baseball metaphors—with references to a whole new ball-game, curve balls, and knocking problems out of the park—likely confused those not from North America. Suddenly, just before Ehrlich's panel on population problems was to begin, a flurry of activity occurred alongside the speaker's platform.[646]

Farvar and his Oi followers—several of who had earlier attended the fractured Independent Conference of Dai Dong in Stockholm—swept through the Environment Forum and forcibly took over the proceedings of Ehrlich's panel. Along with Farvar, a Nigerian woman and Oi Committee member named Dora Obi Chezea seized the microphone from the shocked panel chairman and announced that the press conference had ended. Chezea declared that she would assume chair responsibilities of the panel and that it would be enlarged to include the perspective of Oi Members and anti-population advocates from the global South. In the anarchic melee, one of the original panelists from Survival International, an NGO supporting tribal peoples worldwide, was literally thrown off the platform.[647] The Oi group replaced or added their own members to the session, while most of the international audience cheered and applauded in favor of the panel's mini-revolution. Farvar stood behind Chezea as she fielded questions.[648]

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[645] Holden, "Ehrlich versus Commoner: An Environmental Fallout," 247.
[646] Tom Artin, *Earth Talk: Independent Voices on the Environment* (New York: Grossman Publishers, 1973), 122-128; Ehrlich, "A Crying Need for Quiet Conferences," 32.
[647] Stone, *Did We Save the Earth at Stockholm?*," 134; Artin, *Earth Talk*,122-128.
[648] Ibid.

Although Ehrlich managed to remain on stage, as he remembered it, the session largely turned into an attack on him. The new panel members berated him as a racist in front of the rambunctious crowd. Ehrlich recalled having "accusations of genocide" hurled at him along side the general "assertions that redistribution of wealth would automatically result in an end to population growth by means of a demographic transition."[649] Commoner did not participate in the actual coup of Ehrlich's panel by his former graduate student Taghi Farvar and the Oi Committee. Nonetheless, in Stockholm at the Environment Forum, the Commoner-Ehrlich debate was playing out in a global context with real Third-World participation.

In the wake of his keynote address at the colloquium on Ecology and the Third World months earlier, Ehrlich attempted to repeat his more globally nuanced view that population was only one of the major factors causing environmental harm and that the developed nations should shore up their own population issues before dominating peoples in the developing world. He also attempted to repeat the adaptation he made of Commoner's argument that an equitable redistribution of wealth was essential to environmental corrections. However, Ehrlich still advocated a population control program, which met with continued resistance. According to one observer, Ehrlich "explained that he had changed his mind about (and now made public recantation of) his earlier view, expressed in *The Population Bomb*, that industrialized countries like the U.S. should tie foreign aid to programs of population

[649] Ehrlich, "A Crying Need for Quiet Conferences," 31.

control. But his explanations were ignored by most of the revolutionary panelists."[650] All of Ehrlich's efforts at reconciliation found only hostility from the Forum crowd.

Ehrlich suspected that Commoner had a role to play in this take-over, knowing that Commoner was already in Stockholm and seeing the actions of Taghi Farvar, Commoner's former student, dominating the Forum scene. Some observers claimed to have seen Commoner stationed in a balcony overlooking the chaos in the Forum at the back of the room, from where he was apparently signaling to Farvar and the Oi group as well as sending down questions for panelists and rowdy audience to ask Ehrlich. Given the long history of their debate and the nature of those question, Ehrlich's suspicions of Commoner's involvement reached a boiling point. Amid the accusations of racism, an incensed Ehrlich stood up and shouted repeatedly, "Where's Barry, baby!?," He challenged Commoner to face him in a debate then and there. But, in the words of one report, "Barry baby would not budge." According to this account, Commoner "refused to meet Ehrlich in a direct confrontation" and, instead, "lurked in the gallery," remaining secluded on a balcony overlooking the proceedings.[651] That chaotic scene in the outer ring at Stockholm's Environment Forum reflected the messy environmental conflicts between North and South both within the UNCHE and at Dai Dong's Independent Conference on the Environment. It displayed the dawn of modern global environmental politics in all its still-unresolved glory.

[650] Artin, *Earth Talk*,127.

Placing Blame for a Failed Forum

The Stockholm's unofficial environmental newspaper, *The Stockholm Eco*, published its own account of the chaotic events. The *Eco* mentioned the rabble-rousing performed at the Environment Forum by Farvar, but it clearly blamed Commoner for orchestrating the events against Ehrlich. The *Eco* painted a picture of Commoner "ventriloquising to his puppet army scribbling instructions carried downstairs" with probing questions for Ehrlich to be used by Farvar and other Oi members on the conference floor. Ehrlich's personal assistant as well as the *Eco* both separately accused Commoner of masterminding the events. They claimed Commoner had even stayed up to plan the coup until three o'clock in the morning on the day of the confrontation.[652] Recognizing the connections between the Oi Committee and Commoner, the *Eco* named Farvar as Commoner's "chief lieutenant" who "wandered round the Forum prompting and orchestrating his Oi boys."[653] The *Eco*'s flamboyant coverage of the event revealed the newspaper's severe distaste over the way events had devolved at the Forum, a site of much potential and hope before the environmental events in Stockholm had begun. Ehrlich and Commoner, who never exchanged words directly while in Stockholm together, nevertheless managed to bring their conflict on environmental issues out onto the world stage for the global media and environmentalists to witness in all its newfound bitterness.

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[651] "A Funny Thing Happened to the Environment on Its Way to the Forum" *Stockholm Conference Eco: Jointly Published by The Ecologist and Friends of the Earth*, June 14, 1972, 3; Holden, "Ehrlich versus Commoner: An Environmental Fallout," 247.

[652] Holden, "Ehrlich versus Commoner: An Environmental Fallout," 247; "A Funny Thing Happened to the Environment on Its Way to the Forum," *Stockholm Conference Eco*, 3.

[653] "A Funny Thing Happened to the Environment on Its Way to the Forum," *Stockholm Conference Eco*, 3.

For his part, Commoner defiantly ridiculed the *Eco*'s accusations of his masterminding the attack on Ehrlich. Although, Commoner did not challenge the reality of the Oi group's role. Regarding the coup of Ehrlich'a panel, Commoner told a reporter, "It is scurrilous, absolutely scurrilous, to propose that the [Oi Committee] scientists in the Third World did that at anyone's bidding."[654] Dr. Yusuf Ali Eraj, a family planning doctor from Kenya but also a member of the Oi Committee, acknowledged why the Oi Committee had behaved as they did. Eraj argued that if the Oi Committee had not taken over that day, then "a very different picture would have been given to the world. After all, the world at the moment is looking to Stockholm. That day they didn't stop Paul Ehrlich from saying anything. But he didn't have the monopoly of the panel. And he did admit where he had gone wrong."[655] At the peak of the global environmental moment, the Oi Committee, likely with Commoner's encouragement, worked to ensure the rhetoric on saving Spaceship Earth did not infringe on the rights of people in poor nations to submit to population controls.

Whether or not Commoner did help plan the attack on Ehrlich at Stockholm, he certainly did not step forward to ensure an open and rational discussion of the issues, which Commoner had previously announced as the moral duty of scientists. Publicly, Commoner took no responsibility for Ehrlich's treatment, claiming it was simply the standard practice of spontaneous organizing that had evolved at the Forum throughout the week. Commoner had been there the entire time, he reasoned, and had acclimated to Oi Committee's domination of presentations. Whereas Ehrlich

[654] Commoner quoted in Holden, "Ehrlich versus Commoner: An Environmental Fallout," 247.

had only visited the Forum for one day did not understand what Commoner described as "the temper of the whole program." The only temper Ehrlich seemed to experience, however, was that of the angry attendees from the global South who sought to publicly humiliate him and originally tried to throw him off the stage.[656]

Although Commoner refused responsibility for the attempt to silence Ehrlich, numerous other attendees to the Environment Forum aside from the *Eco* squarely placed blame on Commoner for radical intransigence at the expense of the greater environmental movement. Jon Tinker, a reporter for *New Scientist* described the Stockholm's Environment Forum as "hopelessly confused…mainly by the activities of Professor Barry Commoner and his followers."[657] Harry Pearson, the environment writer for the New York newspaper *Newsday*, covered several of the events in Stockholm. He determined that among the most important events in Stockholm was how Commoner had "dirtied" his once grand reputation. Pearson described Commoner as an "eco-star" and admitted how "Dr. Commoner's arguments on technology and population are very much to my liking." Thus, Commoner's actions at the Forum, which Pearson described as complete "pigheadedness and perversity," came as a great surprise and disappointment. Pearson mentioned a number of examples by which Commoner orchestrated control over open debate in Stockholm, including how "Commoner engineered a public humiliation for Ehrlich at the Forum." Pearson lamented, "For reasons I find impossible to understand, [Commoner] caused environmentalists and scientists to polarize, to take rigid

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[655] Artin, *Earth Talk*,128.
[656] Commoner quoted in Holden, "Ehrlich versus Commoner: An Environmental Fallout," 247.
[657] Jon Tinker, "Indochina: Ecology which Stockholm Forgot," *New Scientist* (June 22, 1972).

positions on the question of population growth even though accommodation between the varying positions seemed possible."[658] Similar to the polarities elsewhere in Stockholm's environment circus, both in its inner and outer rings, the Environment Forum reflected the North-South separation on issues of development and environment, of sovereignty and international regulations, and, due in part to the actions of Barry Commoner and his supporters, over the issues of population control and the social control of technologies.

Other disappointed witnesses to events at the Environment Forum also blamed Commoner for its failures in Stockholm. For instance, when asked about Commoner's behavior in Stockholm, the former head of the Sierra Club and founder of Friends of the Earth David Brower said of Commoner, "I'm afraid he's become very unstable."[659] Additionally, Brian Johnson, a senior fellow at the Institute for the Study of International Organization at the University of Sussex also attended events at the Forum. Johnson received a letter requesting information from the Science and Technology Department of Britain's Foreign and Commonwealth Office to describe some of the events in Stockholm's outer ring in order to supplement the official British records on the UNCHE. Johnson's reply described the Environment Forum as "something of a fiasco" due in part to "the virtual 'take-over' staged by Barry Commoner and his thirty-odd strong group of ex-patriot 'Third World scientists.'"[660]

[658] Harry Pearson, "That Stockholm Conference: Part 2," *Newsday*, June 21, 1972.
[659] Brower quoted in Pearson, "That Stockholm Conference: Part 2."
[660] Brian Johnson to Ronald Arculus, July 3, 1972, Folder 35 [1972 United Nations Conference on the Human Environment, Stockholm, Folder 1 of 2], Box 1, Series 5, Paul and Anne Ehrlich Papers, Special Collections and University Archives, Stanford University, Stanford, CA.

Commoner's hostility to accommodation on the issues of population, among other things, became part of Great Britain's records for major events at Stockholm.

George A. Binney, who attended the Environment Forum on behalf of the Nature Conservancy, also directed his accusations at Commoner. The Nature Conservancy was a major sponsor of Commoner's work at the Center for the Biology of Natural Systems at Washington University in St. Louis. In a letter to Commoner, which he copied to Ehrlich, Binney explained how, prior to Stockholm, he had "very much looked forward" to the Environment Forum as "an expression of scientific fact and the attitudes of peoples of the world." However, upon his arrival to Stockholm, Binney expressed "shock and disappointment" to Commoner "by the way in which you appeared to guide the Forum into polemics favorable to your own interests." In particular, Binney found "the machinations which you devised to undercut your colleague Paul Ehrlich were very disturbing." Binney told Commoner, "I deplore the way in which you turned the Environment Forum into a personal vendetta on Paul Ehrlich and his population theory."[661] Ehrlich's reply to Binney's copied letter reflected his concern about how the events in Stockholm and his seemingly endless conflict with Commoner might impact the global environmental movement. "I hope that this entire dispute can be cooled as rapidly as possible,"

[661] George A. Binney to Barry Commoner, July 16, 1972, Folder 77 [Commoner Debate – Info on Double Publication], Box 23, Series 5, Paul and Anne Ehrlich Papers, Special Collections and University Archives, Stanford University, Stanford, CA.

Ehrlich confessed. "We have more than enough to do in the environmental movement without arguing among ourselves!"[662]

Many others environmental advocates shared Ehrlich's expressed hope that he and Commoner could cool their disagreements and shared sow unity within the broader environmental movement. For instance, Donald Aitken, then chairman of the Department of Environmental Studies at San Jose State College and acting director of the John Muir Institute, had attempted to reconcile the views of the warring scientists for members of the Sierra Club even before Ehrlich and Commoner's confrontation in Stockholm. In the *Sierra Club Bulletin*, Aitkin argued that Commoner and Ehrlich were "Both Right!"[663] Claiming to have "a personal friendship with, and admiration for, both Paul Ehrlich and Barry Commoner," Aitken focused on the similarities between the opposing scientists. "Significantly," Aitken began, "the two share insights and principle in common." He continued,

> Both have stressed the need to apply scientific knowledge to social decision-making. Both men see society irretrievably mining the biological "capital" of the future and see this undermining the entire life-support system, with particularly grim implications for he underprivileged. Both fear the future public health implications of our present actions, and both assume that the solution lies in treating the causes rather than the symptoms of environmental decay.[664]

[662] Paul R. Ehrlich to George A. Binney, July 26, 1972, Folder 77 [Commoner Debate – Info on Double Publication], Box 23, Series 5, Paul and Anne Ehrlich Papers, Special Collections and University Archives, Stanford University, Stanford, CA.

[663] Donald W. Aitken "Commoner and Ehrlich: They're Both Right!" *Sierra Club Bulletin* (April 1972), 11 and 28.

[664] Aitken "Commoner and Ehrlich: They're Both Right!," 11.

Aitkin claimed the only real difference between the two was "on the role that scientists should play in leading the public toward ecologically rational decision making."[665]

Yet that role of powerful experts making decisions as opposed to letting the public make their own decisions over the underlying functions of society remained an important difference, for Commoner and for other actor in Stockholm. At the UNCHE, at Dai Dong's Independent Conference, as at the Environment Forum, representatives of the global South exerted their right to resist the viewpoints of the wealthy and powerful advocates from the global North. Then, as today, there would be no unity over how to assess the political issues deeply embedded in global environmental challenges.

Still, the desire for global unity, now and then, remained a key inspiration for environmental advocates. Kendrick Frazier, chief editor of *Science News*, similar to Donald Aitkin, sought to bring his readers beyond the Ehrlich-Commoner dispute. Frazier announced that the "dispute between Paul Ehrlich and Barry Commoner over the roots of today's environmental problems has gone far enough." Frazier's fear was that the two scientists' personal dispute and "steadfast adherence" to their clashing viewpoints over population growth and new polluting technologies, "at the expense of any more moderate melding of the two," was "likely to threaten the cause of a better environment that they and most other responsible persons espouse." Frazier belittled both Ehrlich and Commoner for their "insistence that it must be one or the other." Frazier concluded that the scientists' inabilities to accommodate and

[665] Aitken "Commoner and Ehrlich: They're Both Right!," 11.

find a middle ground in their debate was "needlessly confusing the issues and delaying necessary solutions."[666]

At Stockholm, however, neither Commoner and Ehrlich nor other actors there would find such a middle ground. And the search for that middle ground remains an ongoing challenge for addressing global environmental issues. Today the notion of sustainable development—while conceptually popular but not often acted upon—seeks to synthesize the conflicts between development and environment that first permeated the UNCHE planning process. Additionally, actors at the global scale have yet to find a sustainable balance between the rights of national sovereignty and the responsibilities of individual nations to subsume those rights for the betterment of a world environment that knows no borders, which became a major political issue at Dai Dong's Independent Conference in Stockholm. And the devolution of the Environment Forum in Stockholm, best represented by the conflict over neo-Malthusianism and the social factors governing technology in the Ehrlich-Commoner debate, also failed to find a middle ground from which to move forward. Few real efforts were made in Stockholm to transcend ideological issues and find consensus, either over population concerns and pollution problems, or between sovereignty and international agreements, or on the conflicts between environment and development. At least at the Environmental Forum, as another disappointed attendee of events at Stockholm explained, "The Third Worlders of radically different ideologies reacted more or less uniformly in violent protest against the concept of population as an issue and for absolute sovereignty as an unassailable

[666] Kendrick Frazier, "Comment: Beyond the Ehrlich-Commoner Dispute," *Science News* 102:7

principle."[667] In Stockholm, at the peak of the global environmental moment, a divided politics on international environmental issues were forged in the much the form that they have essentially remained since.

The Social Construction of Environmental Science

Why did Commoner remain so committed to his debate with Ehrlich? The answer rests in their different views about the role of science and scientists in society. According to historian Thomas Robertson, Ehrlich sought to "place the responsibility for rational planning in the hands of scientific experts, especially ecologists. They alone understand the interrelations of nature, and only they can maintain the intellectual distance necessary to make hard choices." On the other hand, the main priority of Commoner, according to historian Michael Egan, "remained a deep-seated belief that access to information constituted a vital form of public empowerment. The necessity of public participation and the perceived political power of an informed citizenry became his standard theme."[668] Rather than rely on the empowered few who sought to control people and nature, Commoner maintained faith in the idea of an informed democratic society that required a clear understanding of scientific issues in order to make knowledgeable decisions and exact social changes. Commoner believed adamantly that the size of a population

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(August 1972), 99.

[667] Knelman, "What Happened at Stockholm?," 439.

[668] Thomas Robertson, *The Malthusian Moment: Global Population Growth and the Birth of American Environmentalism* (New Brunswich, NJ: Rutgers University Press, 2012), 157; Michael Egan, *Barry Commoner and the Science of Survival: The Remaking of American Environmentalism* (Cambridge, MA: MIT Press, 2007), 106.

remained a social choice for society to determine, not one dictated by scientific knowledge.

Instead of population as a problem, Commoner remained focused on the social dn political challenges posed by the increasingly global technologies of industrial development. Based on his experiences against the development of atomic weapons and indiscriminate nuclear fallout, Commoner came to see the implementation of technologies that unintentionally harmed people and the environment as ill-considered social and political decisions, not the result of natural, biological processes. Commoner thus understood the crisis of environmental degradation as the result of faulty, non-ecological technologies—technologies that were, in turn, the result of social, political, and cultural decisions. Resolution of the global environmental crisis, Commoner concluded, must begin with socio-cultural changes at a global scale. For humanity to save itself and Spaceship Earth, too, it must value and adopt new environmentally harmonious technologies and reform the social systems that govern their use. Commoner saw as insufficient any attempts that merely addressed biological issues, as Ehrlich had originally claimed.

Increasingly, Commoner was unable to separate social problems from environmental problems, particularly as his understanding expanded about the ways in which various technologies of production—from atomic energy, to agricultural chemicals, to industrial smokestacks—were the result of social systems. As a result, Commoner saw inseparable connections, but not necessarily healthy ones, between the environment, capitalist production, and social oppression. Eventually, he applied this analysis to the ways that Western technologies and the social systems that

controlled them influenced rising populations in recently decolonized developing nations. For Commoner, the environment was less associated with non-human biological life as it was a place in which humans were the driving participant organisms. With their anti-ecological technologies and socio-political systems seeking control, humans were driving the environment and human civilization toward total collapse. Commoner's argument with Ehrlich became more than a scientific dispute. It became for Commoner a political battle for the freedom of individuals and societies to choose the future direction for where they would navigate Spaceship Earth.

Another major issue underlying the debate between Commoner and Ehrlich rests in giving too much authority to science as a set of objective truths, in not understanding the mechanics of science as a process, and not recognizing the social and political aspects embedded in constructing scientific knowledge. In other words, it is right to affirm and appreciate the value of scientific evidence and expertise; it is wrong to see science as a definitive truth-maker. Instead, we should recognize science as an on-going and contentious process for unfolding provisional yet increasingly definitive knowledge about nature. At the same time, we must also acknowledge the performance of this process by human actors, namely scientists. Giving blind authority and power to science and scientists, without recognizing reasonably the political and social construction of science, is dangerous.

Paul Ehrlich's call for coercive population control reveals these dangers of ignoring the social and political construction of science. Ehrlich's technocratic view of population growth as an absolutely authoritative and undisputed science opened

the door to an authoritarian and undemocratic course of action. If a drastic reduction in global population was not achieved mutually and quickly, he argued, it must be forced on people coercively, for their own survival. Ehrlich's purely scientific view of population growth in a strict biological framework wrongly rendered the expansion of human populations as apolitical. Doing so also painted the policies for coercive reduction as an equally apolitical and, apparently, necessary solution. Elevating science as uncontested truth removes it and its policy solutions from morals and democratic ideals.

At the climax of the global environmental moment, the primary problem that the Oi Committee, Taghi Farvar, and Barry Commoner found in Ehrlich's population-focused fears was exactly its elevation of science beyond the values of individuals and the choices of societies on Spaceship Earth. The pure population perspective for the global environmental crisis ignored the social and political elements of environmental science. For Commoner and Farvar, politics and society stood at the center of the global environmental crisis. This was the battle they found for at the Environment Forum in one of the outer rings of Stockholm's environmental circus. Their views on science located the causes of environmental crisis in a complex interaction between polluting industrial technologies and the socio-political processes of economics and colonial history.

Seeing science as pure truth also overlooks the inherent elements of uncertainty that exists in any honest science, and it hides from view the social and political aspects of science, especially science used to inform policies or courses of action. We can see such an avoidance of politics, for example, in the 1963 Limited

Test Ban Treaty, which banned atomic explosions in the atmosphere. While a great success in reducing the global threat of radioactive fallout, this limited treaty literally buried underground the environmental politics deeply embedded in the science of atomic weapons, as well as in the policies concerning their existence. Belief that "sound science"—or a totally definitive science—exists or that it leads to good policy is a fallacy, as seen clearly from the failure to pass policies regulating asbestos, or, for that matter, the failure to pass a comprehensive energy policy. To a certain extent, politics, power, and personal interests all play a role both in the creation of scientific knowledge and the creation of policy; getting the science "right" and doing "good" science, does not mean you will get good policy.

As for Commoner, Farvar, and Ehrlich, they all clung to some extent to the idea that the "right" science supported their view of the causes behind the global environmental crisis. Yet only Commoner and Farvar included in their formulations a proper social and political understanding as a part of that science. Though Ehrlich eventually came to appreciate some of the political factors involved in global environmental complexities, he had originally proposed a coercive, technocratic solution to the environmental crisis in which expert scientists like himself would tell people how or how not to reproduce. Commoner, however, was adamant that decisions for correcting environmental problems "belongs not in the hands of scientists and technologists, but to all the people." It was the scientific community's

responsibility, "as the custodians of this knowledge," to clearly explain the causes of the environmental crisis, not induce fear and undemocratic policy suggestions.[669]

By the time it peaked during the global environmental moment in Stockholm's Environment Forum, the Commoner-Ehrlich debate was not really a scientific disagreement. Rather, it centered on the weightier ideological issue of freedom: an individual's reproductive freedom to control their body and family decisions, and a nation's freedom to operate its political sovereignty, and use freely their natural resources to develop industrially according to national needs. While the individual details and context of Commoner and Ehrlich's debate before and during the Environment Forum differed from the details of debates at the UNCHE and at Dai Dong's Independent Conference on the Environment, they all shared broadly similar politics over those same ideological issues of freedom. While the global environmental moment that witnessed the dawn of international environmental politics has ended, those global environmental debates have not yet been resovled.

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Given the important issues and conflicts that the Commoner-Ehrlich debate highlighted at the dawn of global environmentalism, consider, now, what lessons and ironies it offers for our contemporary crisis of planetary climate change. A vast consensus of climate science experts tell us that limiting the drastic effects of climate change requires steep reductions of fossil fuel emissions and other heat-trapping gases. Might concerns for rapid reductions in greenhouse gases relate to Paul Ehrlich's concerns about rapidly reducing rates of human reproduction? For

[669] Commoner, "The Ecological Facts of Life," 35.

instance, if drastic reductions in greenhouse gases do not occur mutually and quickly, does the authoritative science of climate change justify the use of coercive force to save the planet and humanity with it? Do traditionally impoverished nations have a sovereign right to economic self-determination if their unchecked emissions threaten global health and security? Is the climate science authoritative enough to trump poor nations' claims to political and economic equity? Does climate science justify the eventual use of economic, political, or even military force to *restrict* the procurement, trade, or use of fossil fuels?

And what of Barry Commoner and Taghi Farvar? Would their focus on the social and political construction of global environmental problems lead them to *question* climate science that calls for immediate reductions in global emissions? Would they therefore become climate-change skeptics? Or, would Commoner and Farvar align with the traditionally poorer nations who justify growing carbon emissions with claims that colonialism and Western hegemony restricted their sovereign rights to economic development? Such questions are anachronistic. Like a counterfactual history, these questions seek the relative importance and applicability of actions, ideas, and lessons from the past.

Nonetheless, some of the circumstances for the global environmental crisis in the early 1970s appear similar to the crisis of climate change today. For some, disagreement exists now, as it did in the early 1970s, over the primary causes of the environmental crisis. In the case of the debate between Ehrlich and Commoner in the early 1970s, blame for the global environmental crisis went either to natural but excessive biological reproduction, or to human use of faulty technology and

economic exploitation. Today, some climate skeptics cite natural cycles of temperature change as the cause of global warming, while most scientists implicate the human production of greenhouse gases. Similarly, in the 1970s and today, political conflict between and within the global North and South wrestled over issues of national sovereignty and economic development, on the one hand, and desires to limit global environmental degradation on the other. And both then as now, the United Nations provided the primary frameworks for reconciling the conflicting politics embedded in global environmental change.

But the past is not the present; nor is it the future. The way in which the Commoner-Ehrlich debate unfolded in Stockholm highlights the contexts of environmental problems in global environmental moment of the late 1960s and early 1970s. And, it helps us understand the deep political issues embedded in these global environmental problems, both then and now. While the contexts of global environmental crisis in the 1970s and today are quite different, the greatest similarity between the two is likely that finding solutions may prove equally impossible.

CONCLUSION

"Past and present and future are not disjoined but joined. The greatest poet forms the consistence of what is to be from what has been and is. He drags the dead out of their coffins and stands them again on their feet … he says to the past, Rise and walk before me that I may realize you. He learns the lesson … he places himself where the future becomes present."

— Walt Whitman, *Leaves of Grass*, 1855.

"There is much difference of opinion in the scientific community over the severity on the environmental problem and whether doom is imminent or, indeed, inevitable. But one does not have to accept the inevitability of environmental catastrophe to accept the possibility of catastrophe. We need subscribe to no doomsday threat to be convinced that we cannot – we dare not – wait for all the evidence to be in. Time is no ally here unless we make it one. Whether the crisis is, in a physical sense, just around the corner or well over the horizon cannot obscure the fact that we have a policy crisis on our hands right now. We need only look at the unintended results of past decisions."

— Maurice F. Strong, 1972.[670]

After years of planning and anticipation, the various events in Stockholm concluded in 1972 with little agreement on the proper paths for steering or saving Spaceship Earth. The United Nations Conference on the Human Environment (UNCHE), the Dai Dong Independent Conference, and the Environment Forum all ended with limited victories, and their diverse attendees returned to their various homes around the world. What happened, then, to the global environmental moment? After addressing the end of the global environmental moment with a focus on its closure in the United States, I conclude this dissertation with a review of its arguments and an analysis on the legacy the global environmental moment has had

[670] Maurice F. Strong, "Introduction," to *The Plot to Save the World: The Life and Times of the Stockholm Conference on the Human Environment,* by Wade Rowland (Toronto: Clarke, Irwin, & Co., 1973), pg ix.

on international environmental politics, as well as its meaning for the ongoing environmental movement.

End of the Global Environmental Moment

When modern environmentalism first exploded across the 1960s and early 1970s, it was sometimes described as an issue as popular and unifying as "motherhood."[671] Almost everyone could agree on the value of motherhood, as everyone has a mother who gave him or her life. Similarly for environmental issues, who would argue against clean air and water, or against healthy and pleasant living conditions, or against the life-sustaining health of the planet, especially when its health determined the future survival of the human species? Yet, during the global environmental moment, as environmental issues evolved and expanded to the level of domestic and then international policymaking, it became quite clear that environmental action and remediation involved significant social and economic costs. And given the magnitude of those social and economic costs, perhaps environmental values were not so cherished and agreeable after all.

As sociologist David L. Sills pointed out in his analysis of the environmental movement and its critics in the mid-1970s, support or criticism of environmental action typically depended on one's self-interest. For example, he noted that "Industrial managers resist changes in manufacturing techniques that will be troublesome and costly; land owners and land developers resist controls over their

[671] For example, see Barry Commoner, "Motherhood in Stockholm," *Harper's Magazine* 244:1465 (June 1972), 49-54; Kendrick Frazier, "The Men Who Cry Doomsday," *Science News* 102:24 (December 9, 1972), 371.

profit-seeking activities; and utility companies resist the efforts of environmentalists to control their methods of power production and transmission."[672] If environmental topics first appeared as a unifying motherhood issue, eventual realization of its costs created social and political conflict over those costs. Such realizations, and desires of self-interest to avoid those costs, lent to significant declines in the early consensus regarding and popular support for the early environmental movement. Collected evidence from the late 1960s and early 1970s showed a broad build-up of support for environmental issues between 1968 and 1970, peaking on Earth Day 1970. But by 1972, the same year that the environmental circus culminated in Stockholm in a collection of conferences, the once-widespread and unifying environmental movement underwent substantial decline.[673]

A focus on events in the United States offers a specific example and the particular historical contexts for this decline, with both local and international interconnections. By early 1973, having secured the 1972 election in a landslide victory, President Nixon—who had once championed environmental issues—excised himself and the U.S. government from the environmental movement. Just years earlier, Nixon had been quick to harness environmental excitement for his domestic and international political gain. He had proposed and passed foundational environmental legislation like the National Environmental Policy Act (NEPA); he had established the Environmental Protection Agency in 1970; and he had

[672] David L. Sills, "The Environmental Movement and Its Critics," *Human Ecology* 3:1 (January 1975), 1-41, here 7.

[673] For an extensive review of this evidence, see Kenneth E. Hornback, "Orbits of Opinion: The Role of Age in the Environmental Movement's Attentive Public, 1968-1972," (Ph.D. diss., Michigan State University, 1974).

encouraged American leadership on the international environment both in NATO and through the UNCHE planning process. Yet, in the wake of the UNCHE and the growing realization of the social and economic costs and conflicts embedded in environmental issues—especially the costs and conflicts in the context of global North-South relations—Nixon and his advisors shifted away from environmental advocacy and away from the economic costs such advocacy required.

In February 1973, Nixon declared a rhetorical end to the environmental crisis in his annual environmental address. "When we came to office in 1969," Nixon recalled, "we tackled this [environmental] problem with all the power at our command. Now there is encouraging evidence that the United States has moved away from the environmental crisis that could have been and toward a new era of restoration and renewal." Notwithstanding the gilded but shallow accomplishments at Stockholm in terms of the global environment, Nixon had overseen a host of new domestic environmental policies, especially with regard to clean air and water. Yet that legislation had hardly resolved the host of other on-going environmental problems, like chemical toxins in soil, food, and consumer goods. Still, at the dawn of his second and eventually tragic term, Nixon happily reported to Congress that, "we are well on the way to winning the war against environmental degradation—well on the way to making our peace with nature." Especially concerned with cutting costs, Nixon stressed a "balance between economic growth and environmental protection," with environmental costs "more fully met in the marketplace, not in the

Federal budget."[674] As for the role government would play, Nixon announced that local and state governments would have to step up, which by implication, meant individual nations at the international level would have to face their own environmental challenges without U.S. support.

Nixon's allies began tying together excessive costs with environmental action. Also in February 1973, Nixon's chief assistant for domestic affairs, John Ehrlichman, told the Economic Club of Detroit that "dogmatic environmentalists" were to blame for the nation's growing economic challenges related to energy. "You've got to get it across to them," Ehrlichman explained, "that there's a cost to environmental protection." Later in 1973, when Nixon's Council on Environmental Quality issued its fourth report, his White House aids forced the removal of all newly proposed environmental restrictions, even those that followed guidelines set out in the NEPA. Ignoring the report's still-exorbitant estimate for environmental remediation, Nixon adopted environmentalists' systems-inflected rhetoric to celebrate his successful institutionalization of environmental issues: "In place of organizational disorder and fragmentation, we have developed institutions capable of dealing with environmental problems in a systematic and effective way."[675] Sensing declining public support for extensive environmental action, Nixon began rapidly backpedaling away from green initiatives, just as the Watergate crisis and the energy crisis escalated simultaneously.

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[674] Richard Nixon, State of the Union Message to the Congress on Natural Resources and the Environment, February 15, 1973, http://www.presidency.ucsb.edu/ws/?pid=4102, accessed January 18, 2014.

[675] Ehrlichman and Nixon quoted in J. Brooks Flippen, *Nixon and the Environment* (Albuquerque: New Mexico University Press, 2000), 198.

Rising gasoline prices and rolling brownouts in the summer of 1973 preceded the major energy crisis of 1973-1974. In October 1973, a major oil embargo initiated by several Arab states and exploited by the Organization of Petroleum Exporting Countries (OPEC) with drastically raised oil prices ironically contributed to decreased interest and attention to environmental issues. Pinched consumers cared more about rising energy costs than the environmental pollution from energy production or threats about natural resource limitations. The high costs of environmental action could not compete with the high demands of consumers for some stability on the rising cost of energy products and manufactured goods. Energy-related industries, for their part, publically blamed environmental restrictions as the culprit for high costs and demanded relaxation of environmental standards.[676]

The environmental movement was already in decline when the energy crisis peaked and stagflation set in. In January 1974, a *Wall Street Journal* editorial described "Environmentalists at Bay"; in February 1974, the *New York Times* reported, "Environmentalists Foresee '74 as Toughest of Recent Years"; in March, the Deputy Administrator of the U.S. EPA, John R. Quarles, Jr., spoke to the Conservation Foundation on the for "Reenergizing the Environment Movement"; and later in March 1974, *The Economist* magazine's "American Survey" declared that "the environment is short on friends."[677] When the affluence of industrialized society began to contract in the United States, much of the public seemed quick to

[676] J. Brooks Flippen, *Nixon and the Environment* (Albuquerque: New Mexico University Press, 2000), 203.

[677] All articles here cited in David L. Sills, "The Environmental Movement and Its Critics," *Human Ecology* 3:1 (January 1975), 1-41, here 8.

join the less developed countries (LDCs) in demands for greater economic growth, and not for environmental limitations.

For Nixon, the end of 1973 and the start of 1974 saw the Watergate scandal move closer toward threats of impeachment, as the energy crisis continued to spread. American gas prices quadrupled in places with stations running out of gas and occasional fights erupting among angry motorists over the last few gallons. But the energy crunch was not restricted only to the United States. Other nations fared worse. Japan and much of Western Europe, which were even more dependent on cheap Middle Eastern oil from OPEC, suffered from the energy crisis, too. Japan declared a state of emergency and forced a new a system for energy rationing, while the British implemented a shorter workweek to compensate for the escalated costs of energy. As historian J. Brooks Flippen noted, "In only three months, from October to December [1973], the entire industrial West appeared on its knees."[678] Few wanted to hear environmentalists scolding about limited resources and the need to revise the industrial way of life. Instead, they wanted solutions to the energy crisis without sacrificing their standards of living. The realities of living within limits, environmental or otherwise, were far less appealing than notions of limitless growth.

The remainder of 1974 fared no better for environmental attention. Nixon, who became further engulfed in Watergate, sent no environmental message to Congress that year, the first such absence in four years. Instead, he privately stewed about impending impeachment while publically focusing his support for new energy

[678] Nixon quoted in J. Brooks Flippen, *Nixon and the Environment* (Albuquerque: New Mexico University Press, 2000), 207.

strategies through his "Project Independence."[679] Growth and energy became the new priority, while environmental issues appeared only as nagging restrictions that needed removal. Whereas the Santa Barbara oil spill in 1969 helped spark political attention to the growing environmental movement, Nixon in late 1973 and early 1974 encouraged increased oil drilling on the continental shelf, including in Santa Barbara. According to one of his aids, Nixon's demand in February 1974 was to "prepare as soon as possible legislation that would remove all environmental roadblocks to energy production and supply by canceling environmental inhibitions." In March 1974, just before the oil embargo ended, Nixon was even more explicit. He told his cabinet, "promote energy developments … Get off the environmental kick."[680]

After its rapid rise in domestic and international policymaking, the environmental kick was soon kicked aside, and demands for growth reclaimed center stage. By the end of the year, Nixon resigned ingloriously from office. Energy costs continued to rise, and environmental commitments continued to decline. Throughout the mid-1970s, the onset of economic stagnation in several industrialized nations, especially the United States, spurred a shift away from environmental concern and toward demands for renewed economic growth. This broad shift signaled the end of the environmental moment, both in the United States and internationally. Clearly, environmental problems were not suddenly solved, as many of the environmental challenges that inspired environmental concerns have only escalated since 1970, and

[679] U.S. Federal Energy Administration, *Project Independence: Executive Summary* (Washington, DC: U.S. Government Printing Office, 1974).

new global problems like ozone depletion and climate change appeared. Rather, environmental issues—and widespread advocacy to think creatively and boldly about their long-term solution—moved further away from mainstream public concern.

The environment, after all, had been institutionalized at national and international levels, which removed much of the impetus for public anxiety and interest in environmental issues. As historian Jacob Hamblin has written, even if those institutions, like UNEP, lacked the funding and authority to combat the persistence of environmental problems, the mere "creation of the environmental regime itself exerted a placebo effect upon public opinion." In essence, the new domestic and international environmental institutions served to absorb much public concern about environmental problems. Many of those problems had not gone away, as the root issues causing environmental problems—including the social, economic, and political ideologies and structures of modern life on Spaceship Earth that prioritized economic growth and exploitation of resources over sustaining environmental relationships—were never altered. Yet, some element of relief existed in the knowledge that many nations since Stockholm had established environmental agencies, even if weak and ineffectual, and that in Stockholm so many nations had met to declare a loosely agreed-upon set of international principles and actions to address global environmental challenges. Even as the global environmental moment ended, its weak institutions managed to serve, in Hamblin's words, as "a custodian of international public opinion [rather] than of the environment," which masked the

[680] Nixon quoted in J. Brooks Flippen, *Nixon and the Environment* (Albuquerque: New Mexico

ongoing political split between North and South over environmental responsibilities for ongoing environmental decline.[681]

Recapitulating the Argument: "The Global Environmental Moment"

Having addressed the dissolution of the global environmental moment, let me review the arguments I have made throughout this dissertation. I have argued, first, that a global environmental moment arose in the 1960s and early 1970s that first conceptualized and sought to address the interconnected political, social, and ecological challenges that confronted the entire planet and all its inhabitants. That moment offered a unique opportunity to confront global environmental challenges by instituting possibly revolutionary changes to the functions of political economy and to the established structures of sovereignty-based geopolitics. This dissertation further argued that the political contours of international environmental politics were forged during that global environmental moment in the multi-year processes of planning for, and in the events that transpired at, the collection of environmental conferences held in 1972 at Stockholm. The questions driving this dissertation included, What were the conceptual and scientific causes for the global environmental moment in the 1960s and early 1970s? What happened during that moment, particularly in terms of planning for the set of conferences on global environmental issues that occurred in Stockholm in the summer of 1972? And what political conflicts over environmental progress ensued there?

University Press, 2000), 213-214.

In answering those questions, this dissertation has offered an in-depth examination on the evolution of systems thinking in the decades after World War II, which provided the conceptual and scientific frames of analysis that first inspired awareness of global interconnection, embodied in the mid-1960s by the symbol of Spaceship Earth. Such a perspective on global interconnection enabled an understanding of new planetary-scale environmental dangers, first seen in the worldwide threats of atomic fallout, which then expanded to include a host of issues including pollution, overpopulation, and the widespread dissemination of chemical toxins. This dissertation then explored the initial and seemingly revolutionary reactions in industrialized nations, especially in the United States and Japan, to those newly realized environmental threats, including the institutionalization of domestic legislation for prioritizing environmental protection. An important additional reaction by industrialized nations to new environmental concerns included their plan for the UN to hold a worldwide intergovernmental conference on global environmental issues in Stockholm, scheduled for the summer of 1972.

This dissertation then analyzed the powerful political resistance against many of those environmental responses of the industrialized North, led by Brazil but joined by other LDCs, who utilized their numerical majority in the UN to successfully implement their priority of economic development at the center of international environmental policymaking. Despite continued questioning on the potentially negative effects of economic growth on the environment in the early 1970s, the

[681] Jacob Darwin Hamblin, "Gods and Devils in the Details: Marine Pollution, Radioactive Waste, and an Environmental Regime circa 1972," *Diplomatic History* 32:4 (September 2008), 539-560, here 542 and 560.

success of LDCs in focusing international environmental dialog on the importance of economic development laid the conceptual roots for what later evolved in the 1980s and 1990s as the UN agenda of sustainable development.

Lastly, this dissertation offered a study of the events at three different environmental gatherings in Stockholm that sought to unify planetary cooperation toward resolving global environmental problems. However, in Stockholm, the global environmental moment climaxed and collapsed either in unresolved conflict or in nominal compromises with few intentions by wealthy Northern nations for carrying out demands by advocates of LDCs to provide additional funds for ameliorating global environmental damage. Both the Environment Forum and Dai Dong's Independent Environmental Conference in Stockholm ended in discord over how to save Spaceship Earth. And while the UNCHE nominally approved a set of documents reflecting the demands of LDCs for wealth transfers in the name of environmental improvements, the majority of those demands have still never been met. Instead, the events leading up and occurring in Stockholm institutionalized international environmental politics in the rhetorical ruts from which it has yet to genuinely emerge.

Ruts, like those worn into the ground by a wheeled wagon or a car on a heavily traveled dirt road, provide an apt metaphor for the continued challenges and disagreements involving the global environment. Ruts invoke an image of parallel lines, never intersecting, only growing deeper and moving further toward an uncertain endpoint. Similarly, the international politics involving, on one side, the need for ameliorating ongoing global environmental decline and, on the other side,

the demands for unrelenting economic development have, since the global environmental moment of the late 1960s an early 1970s, been standardized in ruts. Despite the UN's promotion of a synthesis first between environment and development in Stockholm and later in the concept of sustainable development, the two ruts of regulatory environmental control and unrestrained economic growth have become standardized points of political debate, unable to intersect in concrete action and only able to move forward toward an unknown future. Philosopher of science Bruno Latour has used a metaphor of standards as the railroad tracks on which knowledge moves; without the tracks, knowledge gets stuck.[682] The twin tracks of environmental politics, forged in the early 1970s, continue to move forward through time, yet they remain stuck in standard debates between limits and growth.

Issues Unresolved, Demands Unmet

While the environmental conferences in Stockholm all sought solutions to the global environmental crisis, they ended in conflict or with weak structures for constituting significant change to widespread and ongoing environmental decline. The brief global environmental moment ended with a continued political divide between advocates of the global North and South over the appropriate focus on which particular environmental problems were most important; on how best to organize global efforts for addressing planetary environmental problems; and over who remained responsible for the costs of resolving global environmental pollution and remediating environmental damage. The global environmental moment thus

[682] For an entrypoint into Latour work, see Bruno Latour, *Science in Action: How to Follow*

ended with a return to the status quo of ideologies centered on economic expansion and the unfettered use of natural resources by sovereign nations.

As a result, between the 1970s and the initial years of the twenty-first century, global environmental decline has continued apace, alongside continued economic expansion. Since the 1970s, half of Earth's tropical forests have disappeared. By 2020, LDCs of the global South are projected to lose an additional fifteen percent of their tropical forests, as much of what remains is under contract for eventual logging. According to conservation biologists, human impact on Earth's biological systems has now placed us in the midst of a massive extinction event, on par with the destruction of the dinosaurs, though today's die-offs stem from human destruction of habitats rather than an asteroid collision. Human actions through exploitation and development of natural resources have so compromised the ability of other creatures to live on Earth that nearly 100 species disappear daily, and roughly one-quarter to one-third of all species appear headed for extinction by 2050. Globally, in terms of wild animals, nearly a quarter of known mammals, an equal number of reptiles and amphibians, and some thirty percent of fish species are threatened with total annihilation. In 1960, only five percent of marine fisheries were either fished to capacity or overfished, yet by the early twenty-first century, more than seventy percent of global fisheries existed at capacity or were overfished. Continued use of chemical fertilizers has produced no less that fifty deadzones throughout the world's oceans, including one in the Gulf of Mexico the size of New Jersey. Freshwater supplies for drinking and other purposes grow increasingly

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Scientists and Engineers through Society (Berkshire, UK: Open University Press, 1987).

stressed, as humans already consume more than half of the planetary supply of freshwater with demands ever increasing. And human alteration of the atmosphere, with ozone-depleting substances and through increased burning of fossil fuels, threatens to transform global ecological systems in ways that, in turn, threaten the stability of our now global human civilization.[683]

Despite this evidence of ongoing global environmental decline and despite the development of significantly different historical contexts since the global environmental moment of the late 1960s and early 1970s, the political demands by nations of the global South on the issues of development and environment—formulated most clearly in the Founex report from 1971—have essentially remained unchanged and unmet.[684] Those demands include, first, an insistence that industrialized nations of the global North remain responsible for global environmental problems. Further, any efforts made to ameliorate those global environmental problems must not limit prospects or actual projects of economic development by LDCs. LDCs also insist on the transfer of additional resources (additionality) from North to South to enhance environmental protection above and beyond established Northern commitment to international aid for development.

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[683] For evidence and statistics on ongoing global environmental decline, I have drawn from Paul Wapner, "After Nature: Environmental Politics in a Postmodern Age," in *Handbook of Global Environmental Politics*, edited by Peter Dauvergne (Cheltenham, UK: Edward Elgar, 2005), 471-485; James Gustave Speth, "Creating a Sustainable Future: Are We Running out of Time?" in *Environmentalism and the Technologies of Tomorrow: Shaping the Next Industrial Revolution* (Washington, DC: Island Press, 2005), 11-19, based on his more extensive study, James Gustave Speth, *Red Sky at Morning: America and the Crisis of the Global Environment* (New Haven: Yale University Press, 2004); and J.R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (New York, W.W. Norton, 2000).

[684] *Development and Environment*: *Report and Working Papers of a Panel of Experts Convened by the Secretary-General of the United Nations Conference on the Human Environment, Founex,*

While those demands have become more nuanced, they have scarcely altered over the past four decades. In making these demands, LDCs of the South seek not only improved living conditions via economic development but also a greater say in global political decisions that affect their nations. Environmental politics thus becomes a tool for LDCs to attempt greater equity in power relations between North and South.[685]

Despite this dissertation's historical evidence that the events of the global environmental moment in the 1960s and early 1970s calcified environmental politics along their unresolved lines, much political science scholarship on international environmental politics still focuses on the linguistic formulation of sustainable development in the 1980s and on the 1992 UN Conference on Environmental and Development held in Rio, Brazil and otherwise called the Rio Earth Summit. At Rio, nations debated and eventually produced a text called Agenda 21 as a blueprint for achieving sustainable development in the twenty-first century. Yet the similarities between events in Stockholm and Rio remain uncanny. For one, Canadian Maurice Strong organized both conferences. And as with the preparatory process for the UNCHE and the eventual production of its Action Plan in 1972, the agreements reached in Rio in 1992 declared that wealthy nations shared a larger responsibility for having caused environmental damage than LDCs, and therefore had a larger responsibility for cleaning up that damage. As with the UNCHE, the Rio conference

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Switzerland, June 4-12, 1971 (Geneva: United Nations; Paris: École Pratique des Hautes Études, VI Section, 1972),

[685] Adil Najam, "Why Environmental Politics Looks Different from the South," in *Handbook of Global Environmental Politics*, edited by Peter Dauvergne (Cheltenham, UK: Edward Elgar, 2005), 111-126.

requested "new and additional" financial resources from the North for environmental improvements across the globe, but especially for the South. But, in Rio as in Stockholm, no serious additional financial commitments were forthcoming. As before, the structural economic issues necessary to accomplish sustainable development remained unaddressed in the UN. As with Stockholm, Maurice Strong insisted the meeting in Rio not only include the UN meeting but an environmental forum for NGOs, too. And as with Stockholm, it was only the NGOs in that forum—not the nations inside the UN conference—that suggested subordinating the globalized free market to the environmental imperatives of global sustainability. In Rio the developed and developing countries split just as they had in planning the UNCHE. The politics forged in the earlier global environmental moment leading up to and taking place in Stockholm remained unbroken, even over new global environmental challenges like climate change. On the issue of climate change in Rio, because of the continued political divide between North and South, nations there agreed only to pursue a framework convention on climate change, which left creation of actual standards and limits for future negotiations, which have famously failed to establish lasting international agreements.[686]

The Moment Ended, but the Movement Continues

But, even if the international politics on the global environment remain in ruts similar to those first formed in the late 1960s and early 1970s, powerful forces today continue to impel those politics to clash. That is to say, global environmental

[686] Felix Dodds and Michael Strauss, with Maurice Strong, *Only One Earth: The Long Road via*

politics continue to grind out in public forums, even with limited progress, rather than simply fade away. One reason remains the ongoing decline and unresolved challenges of the global environment mentioned above. But something else arose in the global environmental moment that continues to push environmental politics toward their continued confrontations, even if they remain politically immobile. That something is the powerful ideology and philosophy of environmentalism itself.

Environmentalism, as an ideology and social movement, offers a call for fundamental change. It provides a powerful force that can ally with other calls for change—for instance, in questioning the sovereign structures of geopolitical relations, in challenging the prevailing economic culture that promotes endless growth, and in seeking greater equity and justice in the dissemination of resources. But environmentalism offers something distinct from other demands and forces for change. Importantly, the ecological conscience of environmentalism provides a compelling and increasingly necessary set of priorities that extends moral considerations to nature itself—what forester and natural resources professor Aldo Leopold called a "land ethic," which "enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land." Ethics has advanced intellectually from the individual to the community, and environmentalism broadens that extension to the Earth. Not unlike some of the systems thinkers who helped see the ecological whole of Spaceship Earth, Aldo Leopold wrote of an environmental land ethic that "A thing is right when it tends to preserve the integrity,

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Rio to Sustainable Development (New York: Routledge, 2012), 36-44.

stability, and beauty of the biotic community. It is wrong when it tends otherwise."[687]

Ecologically, then, environmentalism recognizes the biosphere's inherent interconnection, which requires the protection not just of individual species but of their intertwined habitats to protect the whole web of biological diversity. Socially, environmentalism recognizes that ensuring the stability of life requires the reorganization of political economy along more ecological principles, and it requires the extension of justice and equitable treatment to fellow humans and to the sustaining Earth. And ethically, environmentalism encourages a moral extension of care, awe, and respect to nature—not just the wonders of the wilderness, but to all nature, including all that exists in the technosphere and the econosphere of human societies.[688] It is this final extension of the environmental ethos—which includes not just non-human wilderness but human societies, with all their complex social, political, and economic actions and their technological creations—that opens opportunities for environmentalism as a transformative force for global change.

The global environmental moment helped inspire new appreciation for human society's unbreakable bonds to the interconnected biosphere, including not just biological nature but humanity's social and technological accomplishments made possible by nature's resources. The global perspective embodied in the symbol of Spaceship Earth sought to extend environmentalism's ecological, social, and

[687] Aldo Leopold, *A Sand County Almanac, With Essays on Conservation from Round River* (New York: Ballentine Books, 1966, c1949), 241, 262. See also Roderick Frazier Nash, *Wilderness and the American Mind*, Fourth Edition (New Haven: Yale University Press, 2001), 182-199.

ethical considerations at a planetary scale. That moment arose from the odd assortment and integration of scientific systems thinking, and from harrowing threats to the ecological integrity of those global systems, including anxiety over atomic fallout and fear of silent springs from killer chemicals. The global environmental moment crested and culminated in a collection of conferences that forged the structures of international environmental politics that still stand today, despite the continuation of global environmental problems and the addition of new global threats like climate change.

The global environmental moment rose and fell in the 1960s and early 1970s with a potential for embarking in new directions for human action toward the Earth, toward each other, and for our political economy. But even as that *moment* ended in the early 1970s, the rise of Spaceship Earth helped generate a global environmental *movement* that still seeks to extend those realizations both locally and globally. While the global environmental movement still struggles for political progress inside the staid structures of geopolitics and a globalized capitalist economy that refused alteration during the earlier environment moment, the movement nonetheless still offers a call for fundamental change to our social relations, to our political and economic choices, and to our moral and ethical treatment of the webs of life that support our continued existence. The challenge remains, as it did in the global environmental moment, how to take these global realizations and transform them into actions of influence. But however we continue to struggle in our networks for

[688] William Cronon, "The Trouble with Wilderness: Or, Getting Back to the Wrong Nature," *Environmental History* 1:1 (January 1996), 7-28; Ramchandra Guha, *Environmentalism: A Global History* (New York: Addison Wesley Longman, Inc., 2000), 57-58.

survival, a sense of history, a sense of where we have been on Spaceship Earth, can help serve as a partial guide to where on Earth we are going.

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