Climate Change as a Significant Global Challenge: Pathways to Civil Discourse

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Abstract

Climate change is widely recognized as a pressing global challenge. While it is commonly framed as a scientific and environmental issue, its complexity extends far beyond atmospheric carbon dioxide concentrations and international treaties. Climate change is deeply rooted in historical, political, and humanitarian contexts, necessitating a broader, interdisciplinary approach. Despite its significance, public discourse surrounding climate change remains polarized and contentious, often driven by media sensationalism.

This paper seeks to illuminate the historical and cultural dimensions of climate change discourse, linking contemporary concerns with longstanding environmental apprehensions. By drawing on the history of environmental determinism and climate-related anxieties, it offers a more nuanced understanding of the factors shaping today's debates. The goal is to move beyond ideological entrenchment and cultivate a more constructive, informed, and balanced conversation, aimed at establishing pathways to civil discourse, better cooperation, and responsible environmental stewardship.

Key terms: Climate change, Environmental determinism, Ideological entrenchment, Polarization, Public and civil discourse, Responsible environmental stewardship.

Climate change is a significant global challenge, deemed by many to be an existential threat. It is now at the center of an international agenda to increase scientific understanding, protect the environment, and ameliorate suffering. More than a topic of scientific investigation, climate change constitutes, above all, a complex set of political and humanitarian problems with deep historical roots—problems that cannot be reduced to the mere concentration of carbon dioxide in the atmosphere or solved by international treaties.[1] Unfortunately, climate change has become a contentious and litigious issue, a polarizing topic ripe for new approaches and new insights that open avenues for shared dialogue and build constructive relations. Most people know very little about climate change other than what is reported in popular media. No one has yet linked current climate issues to their deeper cultural roots. Here we intend to do so.

Climate change is a seriously polarized issue in need of fresh air and sunshine, discussion, debate, and thoughtful decision-making. Full, fair, and extensive expositions of its extraordinary complexity—including historical, scientific, political, and cultural dimensions—are not readily available. Today's information landscape—print, broadcast, and online—typically offers limited or one-sided views, making it quite difficult to gather reliable information and quite easy to avoid the

full diversity of reasoned viewpoints. Name calling, cancel culture, and partisan media are all too real and get in the way of the discourses that make democracy healthy and effective. Here, drawing from the long history of environmental determinism and the history of climate change ideas, we investigate the deep roots of climate apprehensions and animus and place these ancient sentiments into conversation with current science and pressing public policy issues, seeking to supplant the modern-day rancor with new pathways to a more enlightened, peaceful, and civil discourse that provides new hope for lasting and just solutions to protect the citizens of Earth and the planetary environment.

In recent decades, humanity has arrived at the realization that global environmental change involves the collective activities, intentional or not, of us all. Resource extraction and ecosystem disruption have reached unprecedented levels, equal or perhaps surpassing those of natural forces. Since the mid-20th century, apprehensions have intensified regarding a number of issues, including population growth, energy consumption, resource depletion, biodiversity loss, and pollution. This is occurring on the largest levels, and we find ourselves questioning the sustainability and even future habitability of the planet. Much of the concern is rightfully focused on changes in the atmosphere caused by human activities, including acid deposition, stratospheric ozone depletion, and unsustainable climate warming. These highly complex technical issues are not the sole purview of scientists and engineers; the problems they represent are rooted in collective human behavior—they belong to us all.

In addition to an ever-growing number of scientific and technical studies, there is a growing awareness that understanding the human impact on the environment is equally important. This sentiment is manifest in the rising tide of initiatives, regulations, laws, and treaties intended to alter human behavior in fundamental ways. New voices from the press, the public, the state, and the environmental movement have flooded the literature, providing new, often polarizing perspectives. Along with the need for clarity on what must and should be done, a cacophony of perspectives makes it appear that those who understand the climate system most profoundly have lost control of the narrative. Reasoned perspectives have given way to voices that alternatively conjure or deny the apocalypse based on a global temperature change of less than one half of one percent. Those sometimes referred to as “warmists” and "green extremists,” with little knowledge of the climate, claim to speak on behalf of the planet, with voices ever more shrill and strident. Some even make the unreasonable claim that climate science, in all its complexity, is settled. Others, deemed “skeptics” (a venerable scientific position), claim there is still much to learn about the climate system, while so-called “climate change deniers” ostensively believe the risks are exaggerated, maintaining that there is no real emergency and we can and should do little to nothing about climate change. The result has been inaction, in large part due to public uncertainty and lack of awareness of environmental risks.

Climate is multidimensional. It is a spatially and temporally variable entity, divided, according to the classification scheme developed in the early twentieth century by Wladimir Köppen, into five main types and some thirty subtypes based on temperature and rainfall criteria.[2] However, climate is much more than the average state of the atmosphere as indicated by weather statistics; it is

something much more fundamental. Climate is the fabric of our lives, conditioning where we live, what we eat, what we wear, and fundamentally, what we choose to do, and a multiplicity of other things, both profound and quotidian. Climate, society, and culture are intertwined. It shapes agricultural practices, religious and ideological sentiments, and perceptions of vulnerability to extreme conditions. The atmosphere is both intimate and universal; it is within our lungs and it constitutes the global commons.[3] It is as personal as a breath of fresh air or a refreshing drink of spring water. Yet, with every passing storm, cold wave, or heat wave, and even under a clear blue sky, our perceptions of nature have been altered by widespread warnings of the destructive reach of global civilization on the planet and its climate.

Scientists equate climate to average weather, or the long-term pattern of weather in a particular region. More recently, given the rise of computer modeling, scientists refer to climate as "the slowly varying aspects of the atmosphere–hydrosphere–land surface system."[4] Climate and climate change are intimately related. Both are at the center of the debate over greenhouse warming and the frequency and intensity of tropical storms. Some argue that climate and weather are distinct, but they are intimately related. For instance, any alteration in the Earth's radiation or heat balance (like brightening clouds or dimming the sun) would impact the general atmospheric circulation, affecting the jet stream and storm tracks. This would, in turn, change the weather. On the flip side, changing the intensity or path of severe storms, or modifying weather over large areas would alter cloudiness, temperature, and precipitation patterns. These changes could have significant effects on monsoonal flows and the overall atmospheric circulation. Systematic repetition of such interventions would ultimately influence the global climate. Thus, although weather and climate involve distinct temporal and spatial scales, they are indeed connected.

Historical Perspectives

The historical dimension of global climate change is worthy of increased scholarly attention.[5] Climate science is more than an assemblage of insights from established disciplines such as astronomy, chemistry, geography, geology, meteorology, and physics. As a newly emerging hybrid field of inquiry, it requires much deeper interdisciplinary understanding of the long-term interactions of climate and culture. Nevertheless, the scientific and policy literature, with notable exceptions, tends to be ahistorical and rather narrowly focused on current issues.[6]

Given the gaps in existing literature, historians have a unique opportunity to enhance our understanding of global environmental change. This is especially true because, over decades, centuries, and millennia, our ideas about the global environment have evolved alongside the environment itself. History matters. However, this insight has yet to fully reach the science and policy communities. With climate change as the focal point, a new interdisciplinary perspective is emerging, encompassing both elite and popular concerns. What experiences, knowledge, and fears have people had about climate change in the past? How have they intervened? What paths have led us to the current state of climate apprehension? Why is the discussion so heated and filled with animus? Can we truly claim to fully understand climate change and address environmental protection without considering intellectual, social, and cultural history? In essence, what can the

study of history offer toward finding a peaceful and lasting solution to current environmental challenges?

Roots in Antiquity

In ancient times climate was thought to be determined by geographical setting, depending only on the height of the sun above the horizon and the slope of the land. The temperate habitable zones were located between the (too frigid) poles and the (too torrid) equatorial zone. The medical geography of Hippocrates of Kos (c. 460–c. 370 BCE) linked human health and climate. In this tradition, illness was attributed to an imbalance in bodily fluids (the four humors), due, in large part, to the effects of a person's exposure to seasonal changes and other geographical factors. In this tradition, airs, waters, and places exerted direct influences, if not control over human health. Again, the healthiest places to live were in the temperate regions of the earth.

Aristotle (384–322 BCE) held strong opinions regarding character and climate. According to his political philosophy, people from a cold climate, as in northern Europe, are "full of spirit, but wanting in intelligence and skill."[7] While they are free, they lack political organization and are incapable of governing others. On the other hand, those from hot regions, specifically the natives of Asia, are intelligent and inventive, but "they are wanting in spirit, and therefore they are always in a state of subjection and slavery."[8] According to Aristotle, the Hellenic race, which is situated in temperate climes between them, is likewise intermediate in character, being high-spirited and also intelligent. "Hence it continues free, and is the best governed of any nation, and if it could be formed into one state, would be able to rule the world."[9] Aristotle's student, Theophrastus (c.371–c.287 BCE) held that local climates can be modified by concerted human agency through deforestation and irrigation.[10] Such notions helped inform, if not determine, attitudes of cultural superiority among groups that considered themselves "civilized," while fostering prejudice and discrimination against "barbarians"—those uncultured peoples from different climes perceived to be primitive, passive, savage, or in modern terms, underdeveloped.

Race remained a major factor throughout history. The Arab philosopher Ibn Khaldun (1332-1406 CE) linked skin color to environmental conditions. He wrote that black skin was directly attributable to the hot climate of sub-Saharan Africa. Like his predecessors, he argued that human behavior and culture, including customs and governance structures, were climatically determined. Khaldun's influential writings were widely disseminated. In translation, they served to reinforce and support cultural prejudices during the era of European colonial expansion.[11]

Enlightenment

Climate determinism, transmitted by generations of scholars, became a perennial philosophy, reinforcing attitudes of cultural superiority and disdain for others. For example, Enlightenment philosopher Jean-Baptiste Abbé Du Bos (1670-1742 CE), member (later perpetual secretary) of the French Academy, linked climate change to cultural changes and creativity. In his 1719 work, *Réflexions critiques sur la poësie et sur la peinture*,[12] ostensibly an essay on aesthetics, Du Bos advanced the notion of temperate zone superiority, arguing that artistic genius flourished only in countries with suitable climates (always between 25 and 52 degrees north), that changes in climate

must have occurred to account for the rise and decline of the creative spirit in particular nations, and that, largely due to cultivation and settlement, the climate of Europe and the Mediterranean area was now warmer than it had been in ancient times. For Du Bos, environmental changes, many of which were human caused, explained both the cultural differences between nations and differences within the same nation in different eras.

As I have argued previously, the basic argument of Du Bos may be encapsulated as follows: "As the grapes of one particular region or year produce a characteristic vintage, so, according to Du Bos, the inhabitants of a particular nation in a given epoch represent a cultural vintage distilled from the overall quality of the air and soil. Only the most favored nations and epochs produced superior cultural distillations; most produced table wines or vinegars."[13] He cited four examples of "illustrious ages" which gave rise to extraordinarily creative cultures: Greece under Philip of Macedon, Rome under Julius and Augustus Caesar, sixteenth-century Italy at the time of Popes Julius the Second and Leo the Tenth, and his own—seventeenth-century France under Louis the Fourteenth, thus placing the art and culture of Europe at the center of world history.

Du Bos, who derived his idea that climate influenced culture from the writings of the ancients, also had a significant influence on his contemporaries, most notably, the French philosopher Charles de Secondat Baron de Montesquieu (1689-1755 CE), who, in his influential book of 1748, *De L'Esprit des loix,* advanced the theory that geography and climate exert powerful influences on individuals and societies. Following Aristotle, Montesquieu wrote that people living in warmer countries possess fiery, but vicious personalities, whereas people from northern nations are braver, but cold and rigid, thus reintroducing climatic determinism to modern thought. An adherent of Hippocratic medicine, Montesquieu claimed that the health of individuals and the governance of nations were directly influenced by hot, cold, and temperate climates.[14]

The Scottish savant David Hume (1711-1776 CE) professed a racial theory of climate. He declared the supremacy of "whites" over people of African descent, asserting that they must constitute two distinct species. On the subject of climate change, Hume followed Du Bos explicitly, writing in his essay, "Of the Populousness of Ancient Nations," that the advance of cultivation in the nations of Europe had caused a gradual change in the climate in the past two millennia. He also thought similar, but much more rapid changes were occurring in the Americas, with the land becoming more temperate in proportion as the woods are felled."[15]

The ideas of Du Bos and those influenced by his thinking generated a powerful vision of the climates of Europe and America strongly influencing culture and in turn, strongly linked to human agency through the efforts of settlers and colonists. By the end of the eighteenth century, Enlightenment thinkers had come to the following conclusions regarding climate change, culture, and cultivation:

1. Cultures are determined or at least strongly shaped by climate.
2. The climate of Europe had moderated since ancient times.
3. The change was caused by the gradual clearing of the forests and by cultivation.
4. The American climate was undergoing rapid and dramatic changes caused by

settlement.
5. The amelioration of the American climate would make it more fit for European-type civilization and less suitable for the primitive native cultures.[16]

Such ideas crossed the Atlantic in two directions. Initially, travel accounts from the New World influenced some of the climate ideas of European thinkers. Their works, in turn, influenced generations of colonials and early American nationals.

Scientific Developments

Travelers and settlers in North America observed that, compared to conditions in the Old World, the atmosphere was more variable, the climate harsher, and the storms more intense. Understanding the reasons for these differences in a region situated further south than most European nations posed a significant challenge in natural philosophy. Many Europeans disparaged the climate of the New World and considered the colonists reckless for risking their lives, health, and families in such an environment. On the other hand, colonists held out hope that the American climate was becoming more moderate due to their efforts to clear the forests and drain the marshes. Those more philosophically inclined thought that it would take many years of observations to resolve the issue.

Thomas Jefferson (1743-1826 CE) advocated a practical policy: "Measurements of the American climate should begin immediately, before the climate has changed too drastically. These measurements should be repeated . . . . once or twice in a century, to show the effect of clearing and culture towards the changes of climate."[17] This was the beginning of more systematic data collection and the beginning of more informed scientific analysis, moving the discussion away from philosophical and literary generalizations.

In 1842 Dr. Samuel Forry (1811-1844 CE) published an analysis of weather data gathered by the U.S. Army Medical Department over three decades at over sixty military posts. Forry's analysis indicated that: (a) climates are stable and no accurate thermometric observations warrant the conclusion of climatic change, (b) climates are susceptible of melioration by the changes wrought by the labors of man, but (c) these effects are mainly local and are much less influential than those of physical geography.[18] Lorin Blodget (1823-1901 CE), an associate of the Smithsonian Institution and author of *Climatology of the United States* (1857), agreed. After preparing a massive compilation of all the available temperature data, he concluded that climates must be assumed permanent until proven changeable. A decade later, Charles A. Schott (1826-1901 CE), a scientist with the U.S. Coast Survey, reported that his analysis of climatic records indicated no change in temperature or rainfall since measurements began.[19] Cleveland Abbe (1838-1916 CE), chief scientist in the U.S. Army Signal Office, the national weather service of the time, agreed that the old debates about climate change had finally been settled, with no important climatic change yet demonstrated since human history began.[20] In 1899 Abbe defined the climate as "the average about which the temporary conditions permanently oscillate; it assumes and implies permanence."[21] Abbe dismissed unproven notions that the growth or destruction of forests, the building of railroads or telegraphs, and the widespread cultivation of crops had systematically changed the

climate. Thus, the shift was complete, circa 1890, from literary to empirical studies of climate—complete, that is, until the carbon dioxide theory of climate change became dominant and 20th-century ideas about climate determinism again reared their ugly heads.

Carbon Dioxide and Climate Change

The debate over climate change caused by human settlement ended just about the time that scientists discovered that the earth had experienced ice ages and interglacial epochs—tremendous advances and retreats of the glaciers over geologic time periods. These discoveries, especially the need to explain multiple glaciations, generated a plethora of complex but highly speculative theories of climatic change. Leading theories included those of John Tyndall (1820-1893 CE), Professor of Natural Philosophy at the Royal Institution of Great Britain, who, beginning in 1859, measured energy absorption by different gases and showed that water vapor and carbonic acid, the hydrated version of carbon dioxide, absorb energy at a much greater rate than regular air. He thought that changes in the amount of these gases in the atmosphere could have produced "all the mutations of climate which the researches of geologists reveal."[22]

In 1896, the renowned Swedish chemist, Svante Arrhenius (1859-1927 CE), published an article "On the Influence of Carbonic Acid in the Air Upon the Temperature of the Ground." In this work, which was based on his modeling efforts, he attempted to explain alternating glacial and interglacial periods by the ability of carbon dioxide to absorb infrared radiation. He argued that variations in this trace component of the atmosphere could have a very great influence on the overall heat budget. His calculations, which were based on a very limited understanding of infrared radiation, indicated that a halving of the percentage of carbon dioxide in the air would lower the temperature of the Earth's surface by 4° C; on the other hand, a doubling of the percentage of carbon dioxide in the air would raise the temperature by the same amount. Arrhenius was not concerned about increasing levels of CO_2 in the atmosphere from the burning of fossil fuels. That would come later, from others. Industry played a minor role. He regarded "volcanic exhalations" as the chief source of carbonic acid for the atmosphere. Despite his recently growing reputation as a "father" of the greenhouse effect, his work was motivated by a desire to explain the ice ages.[23] Rather than being unique or especially prophetic about the effects of a CO_2 doubling, his results were only superficially similar to the results of today's climate models. You might say he got the right answer for the wrong reasons.[24]

Until recent decades, most scientists did not believe that rising CO_2 levels would contribute to global warming. The prevailing thought was that a small amount of CO_2 would absorb all the available longwave radiation, thus any further increases in CO_2 would not affect the planet's radiative heat balance. This perspective contrasts sharply with both the Enlightenment view, which held that human intervention in the form of land clearing and cultivation would beneficially alter the climate, and today's understanding of a harmful "super greenhouse effect" driven by industrial emissions and widespread deforestation. In fact, it was not until the latter half of the 20th century that increased CO_2 was recognized as a significant factor in climate change.

In 1938, the narrative began to shift when British steam engineer G.S. Callendar (1897-1964 CE) presented a paper to the Royal Meteorological Society. He argued that CO_2 emissions from fossil fuel consumption had led to a slight but measurable increase in Earth's temperature, approximately one-quarter of a degree Centigrade over the previous fifty years. The following year, Callendar emphasized that humanity was significantly altering the slow-moving carbon cycle by "throwing some 9,000 tons of carbon dioxide into the air each minute."[25] In a remarkable series of papers, published between 1938 and 1961, Callendar combined the record of rising temperatures in the early twentieth century, estimates of rising CO_2 concentrations from industry and deforestation, and new understandings of the infrared spectrum to warn that anthropogenic global warming was a novel, real, and possibly unwelcome phenomenon. He considered it "a commonplace" that humanity had the capacity to speed up natural processes and had interfered with the carbon cycle, the composition of the atmosphere, and thus the climate. The noted oceanographer Roger Revelle referred to the warming of the early twentieth century linked to industrial emissions as the "Callendar Effect."[26]

In the 1950s, technological developments in computer modeling and access to space provided new tools for climate change science, while raising public awareness of geophysical issues. In 1955, the U.S. government established the first major climate modeling center, the Geophysical Fluid Dynamics Laboratory, now located at Princeton University. The International Geophysical Year of 1957-58 provided an organizational and financial boost to academic geophysics, including meteorology. Regular measurements of the CO_2 content of the atmosphere, initiated at this time, showed a worrisome secular increase.

The Reemergence of Climate Determinism

Nineteenth-century geographers like Friedrich Ratzel (1844-1904 CE) claimed that there were multiple influences of nature on the body and spirit of each individual, on the migration and expansion of populations, and on the social structure and formation of nations.[27] Through his influence, the perennial philosophy of climate determinism reached the 20th century where it became a pervasive ideology, the remnants of which are still with us today. In 1997, the U.S. Department of Education website advised that, "climate very much affects the character of a place" and that "the amount of sun or rain, heat or cold, the direction and strength of the wind, all determine such things as how people dress, how well crops grow, and the extent to which people will want to live in a particular spot."[28] The U.S. Central Intelligence Agency *World Fact Book* uses the pejorative term "enervating" to describe the equatorial climate of the Republic of the Congo and the effect of high temperatures and humidity on visitors. Do they really mean to impugn an entire nation like the Congo with the multiple negative connotations attached to the term enervating (physical weakness, nervous impairment, indolence, wanting in strength of character, spiritless, unmanly, effeminate)?[29] In 1990, the United Nations Environmental Programme convened a workshop, "On Assessing Winners and Losers in the Context of Global Warming." Discussion centered on possible social impacts of climate change under the assumption that global warming would influence different areas of the world in different ways, both negatively and positively, and the losers would be predominantly the Southern tier or developing nations, which could expect border conflicts and environmental refugees. They concluded that all people would likely suffer

physiological and psychological stress in part due to erratic weather patterns caused by global warming, but it would be more extreme in developing nations.[30]

Al Gore, author of the widely discussed book, *Earth in the Balance*, flirted with climate determinism in a chapter titled "Climate and Civilization: A Short History," where he made the following gross generalizations linking both human evolution and social stability directly to climate change: that (1) our distant ancestors, *Australopithecines*, left the forests five million years ago and stood on hind legs because of global cooling; that (2) the ice ages led to the emergence of *Homo sapiens* because "incredible ecological change put a premium on the larger brains needed to adapt to rapidly changing climate conditions"; and that (3) the widespread food riots, unprecedented crime epidemics, and a dramatic increase in the number of suicides and executions following the "year without a summer" (1816) gave great impetus to the "bureaucratic, administrative tendencies of the modern state."[31]

Beyond climatic determinism, there is also a recent tendency I call "molecular reductionism" that focuses attention on a particular microscopic entity—an atom, molecule, or virus—in an attempt to codify and characterize an era and its widespread concerns. We know firsthand that we are living immediately downstream from the deadly variants of the virus COVID-19. We also know what that did to society. Here are some other examples: Radium, uranium, and plutonium symbolized the dawn of the nuclear age, promising both new medical treatments and unlimited energy, but also threatening total annihilation (including omnicide from nuclear war and the death of the biosphere from nuclear winter). DNA promised to serve as the "code of codes" for life itself, reducing the complexity of organisms to their macro-molecular sequences. Regarding weather and climate, the molecule silver iodide (AgI) was considered to be a "trigger" mechanism for cloud seeding that would allow widespread modification or even control of the weather. In the 1970s and 1980s the focus shifted to reducing acid rain and protecting stratospheric ozone (O_3) through the Clean Air acts and the Montreal Protocol. In the 21st century carbon dioxide (CO_2) has become the most feared molecule on the planet, an international symbol of human intervention in the climate system, codifying both affluence, inequity, and apprehension. In trace amounts it is increasingly being called a "climate killer"— toxic to civilization.[32] In much more concentrated amounts, it is a narcotic or asphyxiating gas, known in antiquity as *spiritus letalis*—but to agriculturalists, it is plant food.

Recent Developments

Since the mid-1980s, the primary environmental concern has been global warming due to increased levels of CO_2 and other greenhouse gases. In 1988, NASA scientist James Hansen informed Congress and the world that "global warming has begun." He claimed to have detected the "signal" in the climate's natural variability, suggesting that we might face extreme warming, potentially akin to a runaway greenhouse effect.[33] Although Hansen later amended his statements, his initial declaration marked the beginning of widespread concern about global warming. This, coupled with ongoing alarming reports about the stratospheric ozone layer since 1985, fundamentally changed humanity's relationship with the Earth's atmosphere. What was once a clear blue sky now seemed threatening. How can one enjoy a beach day knowing the risk of sunburn could lead to skin cancer? Are devastating hurricanes the result of human impact on the climate? This is not yet proven. What

about heat waves, droughts, and floods? Again, not directly. Nevertheless, both realists and skeptics must acknowledge that human activities have indeed altered the chemical composition of the atmosphere and our attitudes about it.

The question is not whether human agency has contributed to environmental change. That was answered in the affirmative long ago by the likes of Theophrastus, David Hume, and G.S. Callendar. More significant questions today involve the magnitude and consequences of damages caused by anthropogenic stresses and how to formulate just, effective, and lasting solutions.

In 1988, the World Meteorological Organization and the United Nations Environmental Programme established the Intergovernmental Panel on Climate Change (IPCC), an organization of 193 governments, to provide "regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation," and "to provide governments at all levels with scientific information that they can use to develop climate policies."[34] This new emphasis on the global environment coincided with the end of the Cold War. One year later the Berlin Wall came down, and in 1991 the Soviet Union dissolved into its component republics.

The first IPCC assessment report in 1990 underscored the significance of climate change as a global challenge, urging the need for international cooperation. This report laid the groundwork for the establishment of the United Nations Framework Convention on Climate Change (UNFCCC) in Rio in 1992. This pivotal treaty aims to stabilize greenhouse gas concentrations in the atmosphere at levels that prevent dangerous anthropogenic interference with the climate system.[35] Additionally, the Rio conference saw the enactment of the UN Convention on Biological Diversity, which aspires to "make peace with nature." This convention acknowledges that biological diversity encompasses more than just plants, animals, and micro-organisms along with their ecosystems. It also pertains to human beings and our collective necessities, such as food security, medicinal resources, clean air and water, shelter, and a healthy environment in which to live.[36]

The FCCC supports the annual Conference of the Parties (CoP) which, in its annual meetings adopted the Kyoto Protocol (1997), setting binding emission reduction targets for industrialized countries; introduced the Bali Roadmap (2007) to include all countries in a collective effort to mitigate climate change; agreed at Copenhagen (2009) on a goal to keep global temperature increases below 2 degrees Celsius while providing financing to developing countries; and adopted the Paris Agreement (2015), aimed at limiting global temperature increases to 1.5 degrees C. Although these treaties and conferences have done much good, especially in raising international awareness, major threats to biodiversity and human welfare remain, greenhouse gas concentrations continue to rise, and scientists still do not agree on what constitutes "dangerous" anthropogenic intervention in the climate. No matter how often or how loudly the claim is repeated, there is no agreement that an incremental increase in an atmospheric trace gas constitutes an existential threat to humanity. In 2022 the U.S. Congress passed the Global Catastrophic Risk Management Act requiring the Department of Homeland Security to conduct an expert assessment of potential global catastrophic and existential risks from a number of perceived threats, including artificial intelligence (AI), super volcanoes, asteroid and comet impacts, nuclear war, severe

pandemics, and sudden and severe changes to Earth's climate.[37] While the adverse effects of climate change are undoubtedly increased by human activity, their report concluded that climate change did not constitute a global or existential risk; the impacts are primarily local or regional, for example in severe storm damage or regional drought conditions.

The Conference of the Parties

In November 2024, the 29th Conference of the Parties (CoP 29) took place in Baku, Azerbaijan, attended by some 83,000 representatives of 193 United Nations member states, as well as non-governmental organizations, and related stakeholders. Delegations from developing nations dwarfed in numbers those from Europe and North America. The presidents of the United States and the European Union and the Premier of China, did not attend. Recognizing that climate change extends beyond environmental degradation and intensifies migration, resource competition, and social unrest, particularly in vulnerable regions, the meeting spotlighted connections between climate change and global conflict. The Baku conference focused more on finance than on cutting emissions, with developing nations seeking massive increases in funding from the developed world.

At the conclusion of the meeting, many conference delegates and climate activists expressed their dissatisfaction with the process. Some representatives from developing nations, hoping for, but not receiving a larger financial commitment from the West, left a week early in disgust. After two weeks of rancorous debate and bitter name calling, the richer countries offered to pay $300 billion per year by 2035 to promote mitigation and adaptation, well short of the $1.3 trillion requested by the poorer countries. China refused to pay a cent, and Azerbaijan, a petrostate, made it clear that it was not going to abandon its God-given gift of oil and gas. A representative from Nigeria called the final conference agreement "a joke."[38] With the large influx of delegates, accommodations in the city of Baku were severely stressed. Prices for a standard hotel room peaked at $676 per night, several hundred percent higher than normal. Adding in airfare, including private jets, food, hospitality, and incidentals, yields an estimated cost for the meeting well north of $500 million and possibly much more. These UN summits often feature big promises with little follow-through. Wealthier countries have, over time, pledged greater financial support to poorer countries, but there are questions about how much of that money is actually new—and how much is just existing aid that gets relabeled. Such is the sad state of climate discourse. As a result, some experts have concluded that it's time to rethink the structure of U.N. climate summits, which have been going on since 1995, and try something else.

A Path Forward

Tackling the full environmental, social, and cultural dimensions of climate change are enormously difficult tasks that must involve designing cleaner, quieter cities, more equitable allocation and use of natural resources, and most importantly, getting beyond the ancient and perennial tendency to denigrate others. The solutions need to be irenic—aimed at constructive discourse and reconciliation—not agonistic, combative, or aggressive. They need to take place in a critically important layer of air we all inhabit within two meters of the ground. It is the layer where the atmosphere interacts directly with humans. You live in this layer, and you can experience it at the dining table and the conference table (1 meter) and where people gather to stand and talk (2

meters). It is the "Critical Zone," the sphere of human affairs, and the most influential layer of Earth's atmosphere where we express our opinions. Our future and the future of the planet will be decided here.[39]

Hippocrates and Aristotle invoked natural philosophy, but rather than building on universal principles, they set the tone for environmental determinism and animus between nations and between peoples from different regions and environments. During the Enlightenment, ideas based on these questionable philosophical assumptions were revived by Abbé Du Bos and his followers. These ideas resonated with American colonists and early patriots who believed that settlement and cultivation were improving the New World's climate. In the nineteenth and twentieth centuries, this culture-bound discussion of climatic change was replaced by ostensibly objective but still culturally influenced scientific attempts to measure and study the atmosphere and its changes, and reduce atmospheric phenomena to equations of motion, chemical constituents, and other "manageable" components. However, the atmosphere is too complex and its influence cannot be reduced to its constituent parts.

We need to think more holistically and practice greater care as we seek a peaceful resolution. The Golden Rule principle, "Do unto others as you would have them do unto you,"[40] constitutes a universal aspirational goal for human behavior. On a larger, but still human scale, it is the mission of world religions, "to realize world peace in the new context of the global village."[41] There is more to be done, however. No matter how large the U.N. or other meetings become, they remain contentious. We are in need of a golden rule for the environment that will move challenging climate conversations beyond their current focus on science, policy, and economics, beyond their current acrimony, and well beyond the ancient and perennial animus of environmental determinism to open up new pathways to civil discourse, peaceful reconciliation, and global environmental protection.

Notes

1. James Rodger Fleming, *Historical Perspectives on Climate Change* (Oxford University Press, 1998) provides additional details.

2. Wladimir Köppen, *Die Klimate der Erde: Grundriss der klimakunde* (De Gruyter, 1923).

3. James Rodger Fleming, Vladimir Jankovic, and Deborah R. Coen, eds., *Intimate Universality: Local and Global Themes in the History of Weather and Climate* (Science History Publications/USA, 2006).

4. American Meteorological Society, *Glossary of Meteorology*, https://glossary.ametsoc.org/wiki/Welcome

5. James Rodger Fleming, "Global Environmental Change and the History of Science," *Cambridge History of Science*, vol. 5, *The Modern Physical and Mathematical Sciences* (Cambridge University Press, 2003), 634-50.

6. Spencer R. Weart, *The Discovery of Global Warming: Revised and Expanded Edition* (Harvard University Press, 2008).

7. Aristotle, *Aristotle's Politics*, transl. B. Jowett (Oxford University Press, 1916), 270-271.

8. Aristotle, *Aristotle's Politics.*

9. Aristotle, *Aristotle's Politics.*

10. Clarence Glacken, *Traces on the Rhodian Shore* (University of California Press, 1967), 91-95; 129-30. For an alternative view see Jorge Torres, "Environmental Determinism in Aristotle," *Journal of the History of Philosophy* 62 (2024): 169-93.

11. Warren E. Gates, "The Spread of Ibn Khaldun's Ideas on Climate and Culture," *Journal of the History of Ideas* 28 (1967): 415–422.

12. Abbé Jean-Baptiste Du Bos, *Critical Reflections on Poetry, Painting and Music, with an Inquiry into the Rise and Progress of the Theatrical Entertainments of the Ancients,* 3 vols. Trans. Thomas Nugent (London: Printed for J. Nourse, 1748).

13. Fleming, *Historical Perspectives on Climate Change*, p. 13.

14. "Environmental Determinism," UNC University Libraries, https://exhibits.lib.unc.edu/exhibits/show/race-deconstructed/environmental-determinism----.

15. David Hume, "Of the Populousness of Ancient Nations," in *Essays: Moral, Political, and Literary*, T. H. Green and T. H. Grose, eds. (London, 1875).

16. Fleming, *Historical Perspectives on Climate Change*, p. 18.

17. Thomas Jefferson to Lewis E. Beck, July 16, 1824, in *The Writings of Thomas Jefferson*, ed. A. A. Lipscomb and A. E. Bergh (Washington, D.C., 1907), 71–72.

18. Samuel Forry, *The Climate of the United States and Its Endemic Influences* (New York: J. & H.G. Langley, 1842).

19. Charles A. Schott, "Tables [of Precipitation and Temperature]," *Smithsonian Contributions to Knowledge* 18 (1872), Article 2; and *idem* 21 (1876), Article 5.

20. Sean Potter, *Too Near for Dreams: The Story of Cleveland Abbe, America's First Weather Forecaster* (American Meteorological Society, 2000).

21. Cleveland Abbe, "Is Our Climate Changing?" *Forum* 6 (1889): 678–88.

22. Fleming, *Historical Perspectives on Climate Change*, pp. 66-74.

23. Fleming, *Historical Perspectives*, pp. 74-82.

24. James R. Fleming, "Arrhenius and Current Climate Concerns: Continuity or a 100-year Gap?" *EOS, Transactions of the American Geophysical Union* 79, no. 34 (1998): 405, 409-10.

25. G.S. Callendar, "The Composition of the Atmosphere through the Ages," *Meteorological Magazine* 74 (March 1939): 33–39.

26. James Rodger Fleming, *The Callendar Effect* (AMS Books, 2007).

27. Friedrich Ratzel, *Anthropogeographie* 2 vol. (Stuttgart, 1899).

28. US Department of Education, August 7, 1997 archived website, https://web.archive.org/web/19970807072950/http://www.ed.gov/pubs/parents/Geography/place.html#weather.

29. "Congo, Republic of the," CIA World Fact Book, https://www.cia.gov/the-world-factbook/countries/congo-republic-of-the/.

30. United Nations Environmental Programme, "Report of the Workshop 'On Assessing Winners and Losers in the Context of Global Warming,'" St. Julians, Malta, 18–21 June 1990, https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/29252/OAWLC.pdf.

31. Al Gore, *Earth in the Balance* (New York: Houghton Mifflin, 1992).

32. Jens Soentgen, "On the History and Prehistory of CO_2," *Foundations of Chemistry* 12 (2010): 137–48.

33. Philip Shabecoff, "Global Warming Has Begun, Expert Tells Senate," *New York Times*, June 24, 1988, p. A1.

34. Intergovernmental Panel on Climate Change, "About the IPCC," https://www.ipcc.ch/about/.

35. UN Framework Convention on Climate Change, "UN Climate Change: Working together for climate action," https://unfccc.int.

36. UN Convention on Biological Diversity, https://www.cbd.int.

37. H.H. Willis, et al., "Global Catastrophic Risk Assessment," RAND, Oct. 30, 2024, https://www.rand.org/pubs/research_reports/RRA2981-1.html.

38. Brad Plumer, "Are All These U.N. Climate Talks Doing Any Good?" Climate Forward, *New York Times*, Nov. 26, 2024.

39. James Rodger Fleming and Vladimir Jankovic, eds., *Osiris, Volume 26: Klima* (University of Chicago Press, 2011).

40. Christian Bible, Matthew 7:12.

41. Andrew Wilson, "World Scripture and Education for Peace," *World Scripture: A Comparative Anthology of Sacred Texts* (International Religious Foundation, 1991).