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From the Protection of Nature to Sustainable Development: The Genesis of an Ethical and Political Oxymoron*

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Abstract: Sustainable development is rooted in the history of two divergent movements – for the preservation of nature, and for the conservation of natural resources – and of their relationship with the natural sciences. Ecology has played a central role in this history. As a societal paradigm that is at once ecological, political, and economic, sustainable development is supposed to embody ideal policy for all societies, and to overcome the opposition between these two diverging views of man-nature relationships. An analysis of international texts devoted to sustainable development emphasizes certain fundamental, interdependent principles: true democracy, social sustainability, and respect for the resilience of ecological systems. Despite formal concessions to preservationists with the recognition of the intrinsic value of biodiversity, the sustainable development concept is clearly anthropocentric, and is in direct line of descent from conservationism. As its fundamental principles are not implemented in an integrated way, its ritual evocation fail to hide strong ethical and political contradictions, rendering it merely an impotent utopia.

Keywords: conservation; democracy; sustainable development; ecology; George Perkins Marsh; Gifford Pinchot; John Muir; preservation; protection of nature; International Union for Conservation of Nature (IUCN); utopia.

Résumé : *Le concept de développement durable s'enracine dans l'histoire des mouvements de préservation de la nature et de conservation des ressources naturelles et de leurs relations avec les sciences de la nature, en particulier l'écologie. En tant que paradigme sociétal, à la fois écologique, politique et économique, il se présente comme un projet*

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politique idéal applicable à l'ensemble des sociétés, qui prétend dépasser l'opposition entre ces deux visions profondément divergentes des relations homme-nature. L'analyse des textes internationaux pertinents permet de dégager les principes fondamentaux, interdépendants, qui structurent ce paradigme : démocratie effective, soutenabilité sociale et respect de la capacité de renouvellement des systèmes écologiques. En dépit de concessions formelles aux préservationnistes, avec l'affirmation de la valeur intrinsèque de la biodiversité, le développement durable est explicitement anthropocentré et se situe dans la filiation directe du conservationnisme. Parce que ses principes fondamentaux ne sont pas mis en oeuvre de façon intégrée, son évocation rituelle ne réussit pas à cacher ses contradictions profondes, éthiques et politiques, lesquelles l'obligeront à rester dans le champ de l'utopie.

Mots-clés : *conservation ; démocratie ; développement durable ; écologie ; George Perkins Marsh ; Gifford Pinchot ; John Muir ; préservation ; protection de la nature ; Union internationale pour la conservation de la nature et des ressources naturelles (UICN) ; utopie.*

> The first principle of conservation is development, the use of the natural resources now existing on this continent for the benefit of the people who live here now.
>
> (Gifford Pinchot 1909)[1]

> Now, it never seems to occur to these far-seeing teachers that Nature's object in making animals and plants might possibly be first of all the happiness of each one of them, not the creation of all for the happiness of one.
>
> (John Muir 1916)[2]

The research topic identified in the title of this article lies at the interface between the natural sciences, the humanities, and society. Such a subject is characterized by a complex web of dimensions, at once scientific, ethical, and political, and pertains to the wider social order. Given the specificity and complexity of such a subject, we have decided to refer to its scientific dimension as a background upon which hangs all of the social dynamics that have led to the multiple transformative processes that the environmentalist

1 - Gifford Pinchot, "Conservation," in *Addresses and Proceedings of the First National Conservation Congress Held at Seattle, Washington, August 26–28, 1909*, 4 vols. (Washington, DC: The Executive Committee of the National Conservation Congress, 1910), 1st vol., 72.

2 - John Muir, *A Thousand-Mile Walk to the Gulf* (New York: Houghton Mifflin Company, 1916), 138–39.

movement has undergone since the second half of the nineteenth century.

The title of the article reflects, from the outset and unequivocally, our decision to emphasize the analysis of the ethical and political dimensions of the sustainable development model. This decision is based on several considerations. First, it is important to realize that, for this model, non-scientific dimensions have taken precedence over the scientific. The model of sustainable development uses scientific evidence as a base for policies of governance, but uses scientific terminology in a way that sometimes changes its content. The primary meaning of terms is relegated to the background, engendering new meanings barely related to science. The appropriation of scientific vocabulary and theories, especially from ecology, may suggest to the uninitiated that science plays a primary role, when in fact a number of indicators show that the scientific dimension of this model is no more than a "backdrop," a landscape which, while necessary, does not play a leading role. In this context, the gestures and deeds instead concern the social dimensions, and in particular the links between natural systems (essentially considered as resources) and the socio-economic, ethical, and political dynamics of human populations.

In this regard, and in a way that could be considered emblematic, it will suffice to note what became of the "ecosystem approach" in the model of sustainable development. The ecosystem approach is no longer being viewed as a "scientific methodology" representative of a specific phase in the development of ecology, emerging from a long and arduous epistemological competition between organicist and reductionist perspectives.[3] The ecosystem approach

3 - For the epistemological confrontation between organicism, holism, and reductionist perspectives, see Frederic Edward Clements, *Plant Succession: An Analysis of the Development of Vegetation*, publ. 242 (Washington, DC: Carnegie Institution of Washington, 1916); Henry Allan Gleason, "The Structure and Development of the Plant Association," *Bulletin of the Torrey Botanical Club* 44 (1917): 463–81; Arthur George Tansley, "The Use and Abuse of Vegetational Concepts and Terms," *Ecology* 16 (1935): 284–307; Raymond Laurel Lindeman, "The Trophic-Dynamic Aspects of Ecology," *Ecology* 23 (1942): 399–417; Eugene Pleasants Odum, *Fundamentals of Ecology* (Philadelphia, PA: WB Saunders Company, 1953/1959/1971); Eugene Pleasants Odum, *Ecology and Our Endangered Life-Support Systems* (Sunderland, MA: Sinauer Associates, 1993); Frank Benjamin Golley, *A History of the Ecosystem Concept in Ecology: More than the Sum of the Parts* (New Haven, CT: Yale University Press, 1993). See also the following articles by Donato Bergandi, "'Reductionist Holism': An Oxymoron or

at the fifth Conference of the Parties to the Convention on Biological Diversity (COP-5, Nairobi, 2000) is instead defined as follows:

> The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Thus, the application of the ecosystem approach will help to reach a balance of the three objectives of the Convention: conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

It is clear that this definition of the ecosystem approach, even if it retains a tenuous link to ecology, highlights the "managerial," and not the epistemic dimension of relations between humankind and the rest of the natural world.

In terms of genealogy, the end of the nineteenth century can be identified as the period when the history of sustainable development began. We propose to show that its initiation is closely associated with the movements for the protection of nature on one side, and the conservation of natural resources on the other. These movements had different ideological, philosophical, and ethical foundations. We will show that the concept of sustainable development is the result of their confrontation, over a long process, during which their relationship with science has evolved considerably. An analysis of successive international texts that establish this concept, based on a determination of their epistemological framework, will enable us to discern the arc of this history. We will then explore the hypothesis that sustainable development, as exploited by political and economic powers, generates deep contradictions that may be overcome only by ensuring consistency in the ethical-political assumptions and scientific concepts that underpin legislation designed to govern both relationships between people and people's relationship to nature.

a Philosophical Chimaera of E. P. Odum's Systems Ecology?" *Ludus Vitalis* 3 (1995): 145–80; "Les Métamorphoses de l'organicisme en écologie: De la communauté végétale aux écosystèmes," *Revue d'Histoire des Sciences* 52 (1999): 5–31; "Eco-Cybernetics: The Ecology and Cybernetics of Missing Emergences," *Kybernetes* 29 (2000): 928–42; "Multifaceted Ecology Between Organicism, Emergentism and Reductionism," in *Ecology Revisited: Reflecting on Concepts, Advancing Science*, eds. Astrid Schwarz and Kurt Jax (Dordrecht, Netherlands: Springer, 2011), 31–43.

Humanity at War with the Order of Nature: The Vision of an Avant-Garde Catastrophist

In 1864, George Perkins Marsh (1801–1882) published *Man and Nature*,[4] a book that would greatly influence the development of the environmental movement. The fruit of an encyclopedic approach, this work was at the interface of several scientific disciplines, including human geography, economic history and the emerging science of ecology.[5] It foreshadowed human ecology, which Jacques Élisée Reclus[6] was developing in Europe, as well as notions of restoration ecology, which only coalesced into a separate discipline toward the end of the twentieth century.[7]

The human species, Marsh noted, is able to manipulate nature with unparalleled impact. The industrial revolution leveraged this impact to an unprecedented level, though policies concerning the natural environment had already had catastrophic consequences. Historiographical sources show that soil fertility in the Middle East, Mesopotamia, Spain, Greece, and in many parts of Italy had fallen sharply over time. According to Marsh, among the main causes of this phenomenon, which reached its peak in the Middle Ages but lasted until the nineteenth century, were taxes and other unfair burdens established by the Roman Empire and then by the Church. Although geological causes played a role, the lack of knowledge of natural processes contributed heavily to the development of practices with destructive consequences. As a result, Marsh advocated caution in any transformative process of the world, both organic and inorganic, especially because, as he stresses, "the action of man upon the organic world tends to subvert the original balance of its species, and while it reduces the number of some of them, or

4 - George Perkins Marsh, *Man and Nature: Or, Physical Geography as Modified by Human Action* (New York: Charles Scribner, 1864).

5 - The term "ecology" was coined in 1866 by the German biologist Ernst Haeckel, but the corresponding scientific domain had already been developing over many years out of several different schools of thought. See for example Jean-Paul Deléage, *Une Histoire de l'écologie* (Paris: La Découverte, 1991); Jean-Marc Drouin, *L'Écologie et son histoire* (Paris: Flammarion, 1997); Pascal Acot, *The European Origins of Scientific Ecology*, 2 vol. (Amsterdam: Gordon & Breach, 1998).

6 - See Donato Bergandi, "The Geography of Human Societies," in Acot, *European Origins*, vol. 2, 521–33.

7 - See, for example, Édouard Le Floc'h and James Aronson, "Écologie de la restauration: Définition de quelques concepts de base," *Natures, Sciences et Sociétés*, 3, Special Issue (1995): 29–35.

even extirpates them altogether, it multiplies other forms of animal and vegetable life."[8]

With agriculture and animal husbandry, Marsh explained, human populations began to settle. This was the first step toward societies becoming more "civilized." However, the exploitation of the natural environment caused a plurality of imbalances—floods, the destruction of forests, land subsidence, and so forth. Thus, while leading to the creation of wealth and better living conditions, the development of agricultural and pastoral activities was accompanied by a heavy impact on the natural world, which Marsh interpreted as a war against the order of nature:

> […] with the stationary life, or with the pastoral state, man at once commences an almost indiscriminate warfare upon all the forms of animal and vegetable existence around him, and as he advances in civilization, he gradually eradicates or transforms every spontaneous product of the soil he occupies.[9]

According to Marsh, without "the hostile influence of man," the true "disturbing agent," the relationship between the organic and the inorganic would be relatively stable, changing only gradually.[10] In addition, he remarked, unlike other animals, humans needlessly destroy what they do not consume,[11] and hunt species such as insectivorous birds, which might be able to help them against insects that ravage the forests.[12] By continuing in such a way, unaware of the natural laws and limits of nature, humanity was on the road to making the Earth inhospitable, not only for other species, but also for itself:

> The Earth is fast becoming an unfit home for its noblest inhabitant, and another era of equal human crime and human improvidence, […] would reduce it to such a condition of impoverished productiveness, of shattered surface, of climatic excess, as to threaten the depravation, barbarism, and perhaps even the extinction of the species.[13]

8 - Marsh, *Man and Nature*, iv.
9 - Marsh, *Man and Nature*, 41.
10 - Marsh, *Man and Nature*, 35–36.
11 - Marsh, *Man and Nature*, 120; see also 36–37.
12 - Marsh, *Man and Nature*, 32–33.
13 - Marsh, *Man and Nature*, 44.

Thus, Marsh was one of the first to understand the fragility and finite nature of the natural processes that allowed humans and other species to exist. Almost 150 years have passed since he first denounced the harmful erroneous socio-economic conduct of humanity. It is nevertheless certain that he never imagined a global environmental crisis ensuing as a result of humanity's activities. He thought, for example, that nature would be able to provide all the water necessary for natural systems to function properly thanks to the vast reservoirs of glaciers. Nonetheless, Marsh's avant-garde catastrophism stemmed from a scientifically lucid analysis of the destruction that accompanied the colonization of new lands, and the blind development of agriculture and industry.

Gifford Pinchot versus John Muir: To Conserve is Not to Preserve

Following on from Marsh, in 1873, the American Association for the Advancement of Science prepared a report to Congress in favor of forest preservation. In 1876, the Forest Service was created, which had a considerable influence on the evolution of the environmental cause. Marsh's work also inspired the creation of the Adirondack Forest Preserve in the state of New York, in 1885. In 1891, the Forest Reserve Act decreed the protection of forests against their irrational exploitation by logging companies. Meanwhile, under the influence of William Temple Hornaday, who in 1887 published a book[14] highlighting the problems with the protection of animals in danger of extinction, Congress prohibited hunting in national parks in 1895, and approved a federal decree—the Lacey Act of 1900—which contributed to the protection of nature by outlawing the transport of animals whose hunting was prohibited.

The participants in this remarkable dynamic were split into two camps, one preservationist and the other conservationist. The first saw the natural world, the wilderness, as an autonomous space, whole and primordial, not yet touched by human activities. John Muir (1838–1914), a naturalist and writer, was one of the most charismatic representatives of this movement. Sharing the romantic and

14 - William Temple Hornaday, *The Extermination of the American Bison* (Washington, DC: Government Printing Office, 1889), 369–548, and plates I-XXII (Smithsonian Institution, from the report of the National Museum, 1886–1887).

religious vision of Henry David Thoreau (1817–1862) and Ralph Waldo Emerson (1803–1882), he believed that man and wilderness have the same divine dimension, and that nature does not exist simply to meet human needs. He refused to accept economic utilitarianism as the only option and did not hesitate to point out the irony of the received wisdom of his time—not so very different from that of today:

> The world, we are told, was made especially for man—a presumption not supported by all the facts. A numerous class of men are painfully astonished whenever they find anything, living or dead, in all God's universe, which they cannot eat or render in some way what they call useful to themselves. […] the sheep, for example, is an easy problem—food and clothing "for us," eating grass and daisies white by divine appointment for this predestined purpose, on perceiving the demand for wool that would be occasioned by the eating of the apple in the Garden of Eden. In the same pleasant plan, whales are store houses of oil for us, to help out the stars in lighting our dark ways until the discovery of the Pennsylvania oil wells. Among plants, hemp, to say nothing of the cereals, is a case of evident destination for ships' rigging, wrapping packages, and hanging the wicked. Cotton is another plain case of clothing. Iron was made for hammers and ploughs, and lead for bullets; all intended for us. And so of other small handfuls of insignificant things.[15]

For the preservationists, the contemplation of the natural wilderness, the pure image of creation, offered the highest of human values—aesthetics and morality—the possibility to fully express themselves. Unexploited forests, emblems of the wilderness, allowed people to contact their inner being, and experience an intimate connection with nature. "When we try to pick out anything by itself we find it hitched to everything else in the Universe," Muir wrote in 1911,[16] stating a principle of universal interconnection that was in tune with the holistic principles found in the thinking of the first American ecologists such as Stephen Alfred Forbes (1844–1930) and Frederic Edward Clements (1874–1945).[17]

15 - John Muir, *A Thousand-Mile Walk*, 136–38.

16 - John Muir, *My First Summer in the Sierra* (New York: Houghton Mifflin Company, 1911), 157.

17 - See: Stephen Alfred Forbes, "The Lake as a Microcosm," *Bulletin of the Illinois State Natural Survey* 15 (1887): 537–50; Stephen Alfred Forbes, "On Some Interactions of Organisms," *Bulletin of the Illinois State Natural Survey* 1 (1880): 3–17; Clements, *Plant Succession*.

Gifford Pinchot (1865–1946) was the figure of reference for the conservationist trend. A forester by trade, who had studied at the French forestry school in Nancy, he played key roles in structuring the US Forest Service, developing the forest conservation policy, and raising awareness concerning the importance of rationality in the use of national resources. With his conception of forest conservation based on economic considerations, he saw these resources as invested capital, both productive and open to growth:

> The fundamental idea in forestry is that of perpetuation by wise use; that is, of making the forest yield the best service possible at the present in such a way that its usefulness in the future will not be diminished, but rather increased.[18]

According to this utilitarian perspective, the forest is "the most useful servant of man,"[19] wherein man's obligation is to maintain a balance between harvested wood and wood produced naturally:

> The question is not of saving the trees, for every tree must inevitably die, but saving the forest by conservative ways of cutting the trees. If the forest is to be preserved, the timber crop, now ripe, must be gathered in such a way as to make sure of other crops hereafter.[20]

Pinchot explained the principles of his vision in 1909—before the 1910 publication of his philosophical testament, *The Fight for Conservation*[21]—at the First National Conservation Congress. Development was, in his eyes, of the highest priority:

> The first thing to say about conservation is that it stands for development. There has been a fundamental misconception that conservation meant nothing but the husbanding of resources for future generations. There could be no more serious mistake. Conservation does mean provision for the future, but it means also and first of all recognition of the right of the present generation to the fullest necessary use of all the resources that this country is so abundantly blessed with. It means the welfare of this generation and afterwards

18 - Gifford Pinchot, *A Primer of Forestry*, Part II, "Practical Forestry," Bulletin 24 (Washington, DC: US Dept. of Agriculture, Bureau of Forestry, Government Printing Office, 1905), 2.
19 - Pinchot, *A Primer of Forestry*, 1.
20 - Pinchot, *A Primer of Forestry*, 10.
21 - Gifford Pinchot, *The Fight for Conservation* (New York: Doubleday, Page & Company, 1910).

> the welfare of the generations to follow […]. The development of our natural resources and the fullest use of them for the present generation is the first duty of this generation.[22]

Next in order of priority came the prevention of waste:

> In the second place, conservation stands for the prevention of waste […]. So we are coming […] to understand that the prevention of waste in all other directions is a simple matter of good business. The human race controls the earth it lives upon.[23]

These principles were justified as being in the public good: for Pinchot, before thinking of the conservation of natural resources for future generations, present generations have the responsibility to use these resources for themselves, but with a strict avoidance of waste, which hinders the efficient development of the economy and reduces their own well-being in the long term.

The public good, a patriotic vision that runs throughout *The Fight for Conservation*, was the *summum bonum* to which all other interests had to be subordinated. For Pinchot, because natural resources are finite, the public good requires that economic activity be conducted so as to ensure their sustainability. The purpose of conservation could not have been more explicit: "Conservation means the greatest good to the greatest number for the longest time."[24]

Pinchot enjoyed a friendly relationship with President Theodore Roosevelt and the two held each other in high regard. It is not possible to assert that Roosevelt's progressive orientation was completely determined by the influence of Pinchot, but we should note their absolute agreement on the conservation of natural resources and the fight against the extreme power of industrial trusts. For both, the equal access of citizens to resources was to be guaranteed. It was essential to ensure that specific business groups did not become the sole beneficiaries. Pinchot feared that, should the government fail to ensure respect for the right of every citizen, increasingly powerful monopolies would seize control of natural resources and might even be able to manipulate legislation to serve

22 - Pinchot, "Conservation," 72, 73.
23 - Pinchot, "Conservation," 73–74.
24 - Pinchot, "Conservation," 75.

their interests.[25] In order to guarantee the citizen rights, Pinchot argued insistently for a clear separation of business and politics.[26]

A conference of governors was held in Washington in 1908, thanks to both Pinchot and Roosevelt,[27] at which the conservationist position was given very wide exposure. Roosevelt gave a speech at the opening of the conference[28] that had a strong influence in both America and Europe. He stressed that with the progress of civilization and technological development, humanity had precipitously accelerated its use of natural resources. The wealth of the nation, to be sustainable, must be based on the "wise use" of natural resources:

> The Constitution of the United States thus grew in large part out of the necessity for united action in the wise use of one of our natural resources. The wise use of all of our natural resources, which are our national resources as well, is the great material question of today. I have asked you to come together now because the enormous consumption of these resources, and the threat of imminent exhaustion of some of them, due to reckless and wasteful use, once more calls for common effort, common action.[29]

Advocating a patriotic moral of "national efficiency," Roosevelt condemned economic practices which, favoring special interests, wasted natural resources at the expense of present and future generations.[30] He called for a profound change in the hierarchy of values, with community interests given priority over those of individuals:

> We are coming to recognize as never before the right of the Nation to guard its own future in the essential matter of natural resources. In the past we have admitted the right of the individual to injure

25 - Pinchot, *The Fight for Conservation*, 24–30.
26 - Pinchot, *The Fight for Conservation,* 26, 79–80, 82–84, 88, 94, 103–5, 107, 109–12, 114–16, 128, 129–31, 133, 134, 137, 140, 145–46.
27 - Newton C. Blanchard et al., eds., *Proceedings of a Conference of Governors in the White House, Washington, D.C., May 13–15 1908* (Washington, DC: Government Printing Office, 1909).
28 - Blanchard et al., eds., *Proceedings*, 3–12.
29 - Blanchard et al., eds., *Proceedings*, 6.
30 - Note that the following passage explicitly refers to future generations, the leitmotif of the current model of sustainable development: "In a word, we have thoughtlessly, and to a large degree unnecessarily, diminished the resources upon which not only our prosperity but the prosperity of our children and our children's children must always depend." Blanchard et al., eds., *Proceedings*, 8.

> the future of the Republic for his own present profit. In fact there has been a good deal of a demand for unrestricted individualism, for the right of the individual to injure the future of all of us for his temporary and immediate profit. The time has come for a change. As a people we have the right and the duty, second to none other but the right and duty of obeying the moral law, of requiring and doing justice, to protect ourselves and our children against the wasteful development of our natural resources, whether that waste is caused by the actual destruction of such resources or by making them impossible of development hereafter. […] the property rights of the individual are subordinate to the right of the community.[31]

The conservation of natural resources thus became an integral part of a patriotic framework that saw in "industrial supremacy" and the fight against corporate interests the foundations of the American dream.[32] The declaration of the Conference of Governors, which stated that the prosperity of the nation was based on the availability of resources that should be neither wasted nor destroyed, could not be clearer:

> We agree that […] the sources of national wealth exist for the benefit of the People, and that monopoly thereof should not be tolerated.[33]

In 1909, two events marked the political climate in the United States: the First National Conservation Congress and the *Report of the National Conservation Commission*.[34] In this report, Roosevelt strengthened the political direction he had embarked upon at the Conference of Governors. Looking for a balance to ensure sustainable economic prosperity, he stressed the need to both develop and protect individual freedom and initiative, but on the express condition of preserving and promoting the common good.[35] The

31 - Blanchard et al., eds., *Proceedings*, 10, 11.

32 - "What will it profit this nation to have won the wreath of industrial supremacy, if in our thirst for gold and sudden riches we permit corporate greed, as well as individual avarice and selfishness, to waste and devastate the very sources of our prosperity?" Israel Charles White, "The Waste of our Fuel Resources," in *Proceedings*, Blanchard et al., eds., 36. On industrial supremacy and "the struggle for existence" between nations, see pages 33 and 35.

33 - Declaration of the Governors, in *Proceedings*, Blanchard et al., eds., 193.

34 - *Report of the National Conservation Commission*, 3 vols. (Washington, DC: Government Printing Office, 1909). For details of the congress, see *Addresses and Proceedings of the First National Conservation Congress*, 1st vol.

35 - *Report of the National Conservation Commission*, vol. I, 3: "We should do all in our power to develop and protect individual liberty, individual initiative, but subject always to the need of preserving and promoting the general good."

need to control monopolies to ensure equality of opportunity was reaffirmed: "The unchecked existence of monopoly is incompatible with equality of opportunity. The reason for the exercise of government control over great monopolies is to equalize opportunity."[36] Finally, in the use and conservation of forests, emphasis was again placed unambiguously on the priority given to public welfare: "Our forest policy was established so that we might use the public forests for the permanent public good, instead of merely for temporary private gain."[37]

Should the "common good" then prevail over the preservation of the wilderness? In 1913, a dam, needed by the city of San Francisco to provide water and electricity, submerged a large part of the Hetch Hetchy Valley in Yosemite National Park. Pinchot supported the mayor of San Francisco in the project.

As early as 1901, Muir had been opposed to the project. On some points, however, he appears to have been close to Pinchot and Roosevelt. He was aware of the need for concrete political action to preserve that which had not yet been exploited, and he believed that only a rational management of forests and other natural resources under the control of the government could save what was left of the wilderness.[38] However, here we have a wilderness with iconic, emblematic status, with Muir waging a long battle to prevent its destruction by the dam. Inevitably, Muir's position ran headlong into a concept that prioritized socio-economic needs. The flooding of the valley in 1913 created a dividing line between the two visions of the world, the confrontation of which would indelibly mark debates on the future of the natural world.

1909–1956: The International Movement for the Protection of Nature, between Preservation and Conservation

The ideas of Pinchot and Roosevelt had a certain resonance in Europe. We find evidence in the Proceedings of the First International Congress for the Protection of Landscapes, held in

36 - *Report of the National Conservation Commission*, vol. 1, 4.
37 - *Report of the National Conservation Commission*, vol. 1, 4.
38 - John Muir, *Our National Parks* (New York: Houghton Mifflin Company, 1901), 359–65.

Paris in 1909.[39] There was a potential for fruitful exchanges between the continents, for example at a World Conservation Conference that was planned for The Hague in September 1909; though this had strong support from President Roosevelt, it was torpedoed by his successor.[40]

In Europe, the need for international dialogue on the protection of nature had been felt since the late nineteenth century. In 1910, in Graz, Austria, as part of an international zoology congress, the Swiss naturalist Paul Sarasin launched the idea of an international organization empowered to protect the natural environment at a global level. Under his leadership, the Swiss government organized an international conference in Bern in 1913 on the protection of nature, where the founding act of an advisory commission for the international protection of nature was signed. The commission was given the mission of aggregating and disseminating data relating to the protection of species and habitats. After the war, Sarasin, who was elected president of the commission, tried to revive it and to affiliate it to the League of Nations; however, this was in vain, as it was not supported by the Swiss Federal Council.[41]

In 1923, the French *Société Nationale d'Acclimatation* (acclimatization), the *Ligue Française pour la Protection des Oiseaux* (protection of birds) and the *Société pour la Protection des Paysages de France* (protection of landscapes) organized the First International Congress for the Protection of Nature. This was an initiative of associations, but in close collaboration with a scientific institution, the French National Museum of Natural History (Muséum national d'histoire naturelle). The *Société Nationale d'Acclimatation* was chaired by the director of the Museum, Professor Louis Mangin, and the congress was held at the institution itself. The audience was primarily scientific. An invitation letter was sent to "Learned

39 - Raoul Clermont, Fernand Cros-Mayrevieille, and Louis de Nussac, eds., *Premier congrès international pour la protection des paysages, Paris, 17–20 octobre 1909* (Paris: Société pour la protection des paysages, 1910).

40 - Martin Holgate, *The Green Web: A Union for World Conservation* (London: Earthscan Publications, 1999), 11.

41 - Paul Sarasin traced the brief history of the commission at the First International Congress for the Protection of Nature, in *Premier congrès international pour la protection de la nature: Faune et flore, sites et monuments naturels. Rapports, vœux, réalisations, Paris 31 mai–2 juin 1923*, eds. Raoul de Clermont, Albert Chappellier, Louis de Nussac, Fernand Le Cerf, and Charles Valois (Paris: Imprimerie Guillemot et de Lamothe, 1925), 41–44.

bodies and various competent persons in France and abroad." Signed by Raoul de Clermont,[42] general secretary of the organizing committee, it set out the reasons for this initiative in terms that evoke those of Marsh:

> Nature, in its three kingdoms, is threatened from all sides by advances in industry. The activity of man encroaches upon regions previously inaccessible to his undertakings; his whims, and his short-sighted utilitarianism, are threatening the existence of many animal and plant species.
> Animals that ought to maintain their usefulness, rarity, and beauty are being hunted, killed, destroyed, or find themselves on the cusp of extinction; botanical species, isolated or grouped in particular places and forests, are victims of fatal innovations that, under the laudable guise of industrial progress, rob us of the benefit of trees, or spoil the harmony of our most picturesque sites and our most beautiful landscapes, sometimes destroying venerable witnesses to geological time.
> All the friends and defenders of Nature must join together and speak out, write effective protests, and take protective action to safeguard our natural heritage for the future.[43]

The conference, which asserted the desire to "reconcile the preservation of natural riches and beauty with industrial requirements,"[44] saw repeated denunciations of harmful and scandalous practices with regard to animal and plant species. In addition to evoking the direct destruction of individual beings, the "indirect destruction" of species through human action in the environment was also highlighted, in a decidedly ecological avant-garde approach.[45] The conference declared its wish to see legislation limiting the duration of hunts, and a total ban on the hunting of species in danger of extinction, along with the prohibition of weapons of mass destruction of

42 - The agricultural engineer and lawyer Raoul de Clermont played a major, although little known role in the structure of the international movement for the protection of nature. See Yamina Larabi, Piotr Daszkiewicz, and Patrick Blandin, "Premier congrès international pour la protection de la nature, faune et flore, sites et monuments naturels: Hommage à Raoul de Clermont (1863–1942)," *Le Courrier de l'Environnement de l'INRA* 52 (2004): 117–21.

43 - de Clermont, Chappellier, et al., eds., *Premier congrès*, 5. Note that this is undoubtedly one of the first appearances of the term *"patrimoine naturel"* [natural heritage].

44 - de Clermont, Chappellier et al., eds., *Premier congrès*, vii.

45 - See the communication by Fernand Le Cerf, "La Protection des lépidoptères et celle des formes vivantes en général (faune et flore)," in *Premier congrès*, de Clermont, Chappellier, et al., eds., 179–80.

animals.[46] It also called for: a cessation of economic activity causing massive deforestation, the creation of an international convention to protect marine mammals, and the establishment of reserves and national parks to protect flora and fauna. Marine pollution from oil spills, with their devastating consequences for wildlife and seaside tourism, was also condemned.

Sarasin began his communication, entitled *La Protection mondiale de la faune sauvage* [Global Protection of Wildlife], thusly:

> As modest as our means of action may be, it is for the whole of humanity that we are working, not only for the present generation, but for those of the future, across the globe, from one pole to the other. The brief account I want to give you of this immense task concerns only the conservation of wild animals.[47]

Protection, conservation – beyond his words, Sarasin's main concern was the maintenance of species, in the interest of present and future generations. In his closing remarks, Professor Mangin, while condemning the destruction of species, stressed the need to reconcile natural conservation with economic transformations, and he advanced the idea that the prudent use of natural resources should be ensured in perpetuity.[48] Obviously, while the word "protection" was, for many Europeans, the equivalent of "preservation" in the meaning of Muir, the idea of "conservation" in the meaning of Pinchot was clearly present, and explicitly associated with concern for the future.

While many scientists participated in these conferences, communications were rarely scientific in nature, with the exception of certain allusions. However, it is clear that one of the motivations for the protection of nature was the scientific value of species and natural sites, which was placed on the same level as aesthetic and cultural considerations. The scientists of the time were concerned with protecting natural elements (species and places) because of their interest to research.

46 - In the colonies, wild animals were hunted with machine guns, planes, and tanks.
47 - Sarasin, in *Premier congrès*, de Clermont, Chappellier, et al., eds., 24.
48 - de Clermont, Chappellier, et al., eds., *Premier congrès*, 317.

In 1931, the Second International Congress for the Protection of Nature was held, again at the National Museum of Natural History.[49] Organized within the framework of the Universal Exhibition, it was summoned by the Standing Committee for the Protection of Colonial Wildlife, which had been created on the initiative of Abel Gruvel, a professor of the Museum who had been deeply involved in environmental protection since the congress of 1923.[50] The same concerns were present as had been evident in 1923, but the problem of the increasing pollution of the seas and rivers had by now become impossible to ignore. The congress proposed the prohibition of all oil discharge from ships near the coast, with the aim of protecting marine fauna and flora, and, more broadly, sought to prohibit industries from allowing chemical pollutants to spill into the sea or rivers. The proposal was accompanied by the suggestion that these industries contribute to a budget for the restoration and maintenance of nature reserves.[51] Finally, a stated aim of the congress was to introduce ecological education into training in forestry. This was one of the first signs of interest in this new discipline, which was considered helpful to ensuring effective action in favor of environmental protection.[52]

In Brussels, in 1928, at the instigation of the Dutch Committee for the International Protection of Nature, the National Committee for the Protection of Colonial Fauna, and the Belgian Committee for the Protection of Nature, the International Union of Biological Sciences decided to take up Sarasin's idea to set up an international organization. Originally called the International Office of Documentation and Correlation for the Protection of Nature, it later became the International Office for the Protection of Nature (*Office international pour la protection de la nature*). Its objectives were: 1) to collect documents, scientific studies, and data of all kinds "regarding nature protection and especially the preservation

49 - Abel Gruvel, Charles Valois, and Georges Petit, eds., *Deuxième congrès international pour la protection de la nature (Paris, 30 juin–4 juillet 1931): Procès-verbaux, rapports et vœux* (Paris: Société d'éditions géographiques, maritimes et coloniales, 1932).

50 - Professor Gruvel was the author of a proposal for a wildlife protection project for the colonies, in which lists of priority species and suggestions for forty sites for nature reserves were detailed. See de Clermont, Chappellier et al., eds., *Premier congrès*, 352–59.

51 - Gruvel, Valois, and Petit, eds., *Deuxième congrès*, 353–55, 547–48. The precursor of the "polluter pays" principle is seen here, long before its adoption in 1987 (in the Single European Act); however, this principle is still confronted with numerous difficulties in application, and often bypassed completely.

52 - Gruvel, Valois, and Petit, eds., *Deuxième congrès*, 546.

of the fauna, flora, and natural scenery in a primitive state" from around the world; 2) to facilitate international cooperation between institutions and individuals interested in these issues; 3) to undertake technical study and research concerning the protection of nature; and 4) to organize propaganda, mainly international, for the protection of nature.[53] It is important to note that this organization was created with a clear preservationist purpose, and not within an intergovernmental context—as had been the case of the commission created in 1913 by representatives of twenty governments—but within a scientific context. The IOPN had a clear mandate to promote "technical" scientific research, in the service of protection goals.

The 1931 Second International Congress for the Protection of Nature gave its support to the IOPN, wishing it to be officially "recognized, supported and funded by all governments interested in the protection of nature," but "pending the establishment of an official central international organization."[54] In 1946 and 1947, in Basel, then in Brunnen, Switzerland, two international conferences were held that paved the way for the creation of a union to involve states formally. Thanks to the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the French government, who were persuaded (not without difficulty) by the director of the Museum, Professor Achille Urbain, and the physicist and academic Pierre Auger,[55] an international conference was held at Fontainebleau in 1948 to create the *Union internationale pour la protection de la nature* (International Union for the Protection of Nature—the IUPN). Delegates from eighteen governments, one hundred and eight public institutions and nongovernmental organizations, and eight international organizations signed the founding document.[56] Thus, a unique organization was created, involving governments and representatives of civil society. According to

53 - International Office for the Protection of Nature, *Report for the Years 1940–1946 and Review of Bibliography on the International Protection of Nature [Short Notes on the Preservation of Wild Life in Various Countries]* 1, Amsterdam (January 1947): 8–11.

54 - Gruvel, Valois, and Petit, eds., *Deuxième congrès*, 537. The need for a formal organization was also expressed in 1931 at a general meeting of the International Union of Biological Sciences, which again demonstrated the importance given to the protection of nature by the scientific community.

55 - Holgate, *The Green Web*, 29–30.

56 - IUPN, *International Union for the Protection of Nature, Established at Fontainebleau, 5 October 1948* (Brussels: IUPN, 1948): 32 p.

Article II of the IUPN constitution,[57] it was composed of: a) governments; b) administrations and public institutions dealing with environmental protection; c) international intergovernmental and nongovernmental organizations, institutions, and associations concerned with environmental protection; and d) national nongovernmental organizations, institutions, and associations concerned with environmental protection.

If, in its title, the word "protection" gives a preservationist tint to the IUPN, the preamble to its constitutional text is notably conservationist, establishing an equivalence between "nature" and "natural resources" as shown in the following passages:[58]

> […] the term "Protection of Nature" may be defined as the preservation of the entire world biotic community, or man's natural environment, which includes the earth's renewable natural resources of which it is composed, and on which rests the foundation of human civilization.

And further:

> […] the time has come when human standards of living are being depressed because natural resources are becoming inadequate for their maintenance; […] this trend may be reversed if people are awakened in time to a full realization of their dependence upon exhaustible natural resources and recognize the need for their protection and restoration as well as for their wise and informed administration in order that the future peace, progress and prosperity of mankind may be assured.

In addition to this conservationist philosophy of the preamble to the IUPN constitution, we find opposing preservationist goals, made explicit in Article I. According to these goals, the IUPN was to advise and encourage all national and international action concerning:

> […] the preservation in all parts of the world of wild life and the natural environment, soils, water, forests, including the protection and preservation of areas, objects and fauna and flora having scientific, historic, or aesthetic significance by appropriate legislation

57 - IUPN, *International Union*, 17.
58 - IUPN, *International Union*, 16.

> such as the establishment of national parks, nature reserves and monuments and wild life refuges, with special regard to the preservation of species threatened with extinction.[59]

There is no reference to natural resources. In its founding moment, the IUPN was an oxymoron.

Soon afterwards, in a document prepared by the IUPN in 1949,[60] the first secretary general of the union, Jean-Paul Harroy, published an unambiguous "Definition of Nature Protection":

> The time is past when nature protectors spoke only in the name of ethics and beauty. But the admission that these two ideals, though among the purest and highest, have little power over the actions of mankind, does not say much in its favor. Now the hour has come when large-scale action to conserve soils, forests and wild fauna should be taken in a practical manner that will convince the masses by its utilitarian motive.[61]

The document also includes the records of the proceedings of a technical symposium associated with the Fontainebleau conference. The Secretary of the Society for the Preservation of the Fauna of the Empire (United Kingdom) spoke there in the same spirit as Harroy, saying he was under no illusions that in order to convince governments, it would be necessary to demonstrate the self-interest involved, citing economic arguments in favor of protection.[62]

A technical conference, prepared by UNESCO and the IUPN, was to be held conjointly with the United Nations Scientific Conference for the Conservation and Use of Natural Resources, scheduled for 1949 at Lake Success, in the United States. The preparatory documents of these conferences shows that the founders of the IUPN recognized a close relationship between their concerns and those of the organizers of the United Nations conference, "intended to provide administrators, economists, sociologists, and engineers with weapons in their struggle against the waste of natural resources

59 - IUPN, *International Union*, 17.
60 - *Preparatory Documents to the International Technical Conference on the Protection of Nature, August 1949, U.S.A.*, edited by the Secretariat of the International Union for the Protection of Nature (Paris-Brussels: UNESCO, 1949).
61 - Jean-Paul Harroy, "Definition of Nature Protection," in *Preparatory Documents,* 12.
62 - *Preparatory Documents,* 56.

and for increasing their output."[63] Clearly, then, the founders of the IUPN leaned towards a conservationism in the image of Pinchot. It is important to note that the United Nations found itself sponsoring both a conference dedicated to natural resources and another dedicated to the protection of nature. These conferences were held together to facilitate the participation of experts involved in the two events, but it is notable that the first could have been chaired by Pinchot, and the second by Muir.

The IUPN technical conference constituted a major step in the evolution of the conservation movement. In accordance with the guidelines laid out at Fontainebleau,[64] it put in place the scientific foundations of the IUPN. The spirit of the work was summed up by the secretary general of the conference, Harroy:

> As fast as the continual accumulation of knowledge forces the scientist to narrow the scope of activities in which he can claim to be called a specialist, he is compelled — paradoxically enough — to break down the walls which separate arbitrarily one scientific discipline from another. The concept of interrelations is particularly relevant in the observation of biological equilibriums, for the naturalist, especially if he wishes to interfere in such delicate balances, must be imbued with the idea that all phenomena is actually one phenomenon and that an abrupt change in any of the factors in play can only have profound repercussions on the complex whole even if he has not been able to anticipate the repercussions in his imagination. Repeatedly throughout the discussion at the Conference meetings, this truth was emphasized and reiterated, whether the disruptive factor in the natural equilibrium was the introduction of an exotic species, the extermination of big game herds, or the unwise use of powerful modern insecticides.[65]

63 - *Preparatory Documents,* 72.

64 - The technical symposium of Fontainebleau proposed to include in the agenda "International co-operation in scientific research in the field of the 'Protection of Nature,' particularly in connexion with ecological research in various branches of the exact and natural sciences." IUPN, *International Union*, 15. During the discussion, Mr. Vogt, representative of the Pan-American Union, stressed that, in light of the relations arising from the confrontation of a constantly changing population with an environment that is also constantly evolving, the issue concerned human ecology. *Preparatory Documents,* 68.

65 - Jean-Paul Harroy, "Introduction," in *International Technical Conference on the Protection of Nature*, *Lake Success, 22–29 – VIII – 1949; Proceedings and Papers* (Paris-Brussels: UNESCO, 1950), ix.

The call for interdisciplinary cooperation could not be clearer. The proof is to be seen in the first wish expressed by the conference, to definitively base "development"[66] on scientific research. The conference noted the fundamental character of human interactions with nature. It was therefore clearly necessary to increase the knowledge of human ecology, ensuring that this knowledge rested on a sound scientific basis. This led to a second aim of the conference, one that showed a remarkably anticipatory vision, given that its implementation is far from having been realized even sixty years later. The conference proposed that in certain ecological regions, carefully selected especially for their bio-geographic representativeness, studies should be conducted according to proposals that were based on a systemic conception and expressed a broad understanding of interdisciplinarity. This was a major step forward from two points of view. First, it gave central importance to human ecology, conceived as the interdisciplinary study of interrelationships within systems to which humans belong. Second, it made research in human ecology indispensable to solving conservation problems. This was needed to help understand the processes underlying the balance of nature and how these are affected by human activities.

The introduction to the conference proceedings shows some hesitation between a preservationist and a conservationist attitude, albeit with a clear tilt to the latter. Commenting on the backing provided by UNESCO, Harroy wrote:

> At a time when the hiatus between the productive potential of the natural world and the requirements of an ever increasing human population is getting perturbingly wider, the protective interest of these Agencies brings much needed encouragement to the vanguard of enthusiasts throughout the world who often seem to be preaching in a desert in their crusade for respect of Beauty and appreciation of living things as well as moderation in exploiting and developing resources.[67]

At this point in the text, a balance had been maintained between aesthetics and economics. Harroy then evoked the motivations of the conference participants "[…] whose parity of interests brought

66 - The use of this term in the context of this conference may seem strange, but it is symptomatic of the ideological shifts between protection and conservation.
67 - Harroy, "Introduction," vii.

them together to synchronize their love of Nature, their uneasiness about the abuses of modern economy, and also their courageous hope for the future"[68]– terms that Muir would probably have found acceptable. But Harroy stressed too, and we see here a "Pinchotian" conception reappear, that "the time is over when the focus of conservation ideas can be directed towards merely making regulations or establishing nature reserves and national parks to safeguard biotopes and species solely for aesthetic or scientific purposes only."[69]

According to Harroy, the executive council of the IUPN had taken the risk of deliberately breaking with custom by giving priority to education and ecology. Education is necessary because:

> Unless a population is aware of its moral obligation and the material advantages that are to be had by respecting the living communities which form its environment and from which sustenance is derived, no laws, no matter how severe, can save these natural communities from disintegration and even destruction when some kind of economic profit is at stake.[70]

Ecology is necessary, because it is essential to understand how man, by diverse means, disrupts the natural balance. Thus, a concept of ecological science was sketched out, allowing a clear understanding of the laws governing the balance of nature and the anthropogenic processes that disrupt it, giving the conservationist the instruments necessary to maintain the natural resources that an ever increasing number of human beings would increasingly need.

In 1954, the IUPN elected Professor Roger Heim, director of the National Museum of Natural History, as its president. The election of a respected scholar was particularly important as it meant the IUPN had finally become "a science-based body."[71] Heim was a lover of nature, distressed by the destruction he had observed throughout the world.[72] While preservationists recognized him as

68 - Harroy, "Introduction," xi.
69 - Harroy, "Introduction," vii.
70 - Harroy, "Introduction," ix.
71 - Holgate, *The Green Web*, 61–62.
72 - Roger Heim, *L'Angoisse de l'an 2000: Quand la nature aura passé, l'homme la suivra* (Paris: Éditions de la fondation Singer-Polignac, 1973). Roger Heim published a number of texts, written during his career, which were often alarmist and always combative.

one of their own, albeit "converted" to conservationism as a last means to try to curb the increasing destruction of natural environments, they probably did not imagine that the philosophical, ethical, and political shift, which had begun in Fontainebleau, would materialize so concretely under his presidency, at the general assembly of the IUPN in 1956. Not without opposition from continental Europeans, but under pressure from Anglo-Americans for whom "Protection of Nature" referred to a sentimental, unrealistic, and negative goal,[73] the name of the organization was changed to the *Union internationale pour la conservation de la nature et des ressources naturelles* (International Union for the Conservation of Nature and Natural Resources—the IUCN). This change brought to the fore the specific economic concerns proper to utilitarianism and definitively crystallized the difference between the heirs of Muir and those of Pinchot.

Modern Environmentalism, or Scientifically-Based Environmental Concern

In the early 1960s, a new approach to the relationship between humans and nature emerged, focusing on quality of life, environmental protection, and the impact of technology on the environment. It was named the "New Environmentalism."[74] In the United States, a movement was born, founded on the preservationist spirit, but advancing scientific arguments made by ecology and toxicological studies on pesticides. Rachel Carson, the American zoologist (1907–1964), published a sensational book, *Silent Spring*, in 1962,[75] which severely criticized the chemicals used in industry and agriculture. These chemicals disrupted the natural balance,

73 - Holgate, *The Green Web*, 63–65.

74 - See Samuel P. Hays, *A History of Environmental Politics since 1945* (Pittsburgh, PA: University of Pittsburgh, 2000); and Carolyn Merchant, *American Environmental History: An Introduction* (New York: Columbia University Press, 2007).

75 - Rachel Carson, *Silent Spring* (Boston, MA: Houghton Mifflin Company, 1962). The topics covered in *Silent Spring* had been anticipated by Paul Shepard, "The Place of Nature in Man's World," *School Science and Mathematics* 58 (1958): 394–403, also quoted by Carson. The question of the impact of insecticide was widely discussed at the conference in Lake Success. In France, Heim, director of the Museum from 1951 to 1965 and chairman of the IUCN (1954–1958), raised this issue in 1954 at a symposium on the ecological regions of the world, the proceedings of which were published in 1955 in the *Annals of Biology*, Volume 31.

increased the genetic resistance of target species,[76] entered the food chain, and threatened the lives of entire populations of animal and plant species, not to mention the health of human populations, while not even achieving their stated goal of exterminating "harmful" species of insects. Like Muir, Carson saw humans as an integral part of nature. Her warning cry was given in the hope of awakening a spirit of reason in her contemporaries—humans would not escape the devastating effects of pollutants any more than would the birds of the fields.

Carson criticized public officials and industries that presented the application of insecticides and other chemicals (what she called the "chemical death rain"[77]) as being "improvements" to the state of nature that favored specific human activities. With Frank Edwin Egler, ecologist and author of a paper with the explicit title "Pesticides—In Our Ecosystems,"[78] she denounced scientists who should have assessed the toxicity or safety of pesticides as being appendages of or affiliates to big industrial groups.[79] In addition, scientifically valid possibilities such as biological control were not being explored.

Carson demanded that new technologies be rigorously verified before being placed on the market—environmental pollution should be avoided at the source.[80] In the same spirit, Barry Commoner, an American biologist who also contributed to the birth of New Environmentalism, considered the main cause of the environmental crisis to be the existing model of economic growth.

76 - In this regard, Paul Ralph Ehrlich pointed out that, contrary to what the commercial propaganda of pesticide manufacturers often claimed, "in fact, pesticides often create pests," *The Population Bomb* (New York: Ballantine Books, 1968), 51.

77 - Carson, *Silent Spring*, 12, 67–68, 162–69. Today, the political confrontation between independent experts and the agrochemical industry (at the national and European level) concerning the persistent use of systemic insecticides such as Gaucho, Regent, and Cruiser, which are harmful for biodiversity, clearly shows that the battle initiated by Carson is not over and is increasingly relevant.

78 - Frank Edwin Egler, "Pesticides—In Our Ecosystems," *American Scientist* 52 (1964): 110–36. Egler regarded *Silent Spring* as "the most important single study in ecosystematics that has been written" (Frank Edwin Egler, *The Way of Science: A Philosophy of Ecology for the Layman* [New York: Hafner Publishing Company, 1970], 101). See also Frank Jr. Graham, *Since Silent Spring* (Boston, MA: Houghton Mifflin Company, 1970), 42.

79 - Rachel Carson, *Lost Woods: The Discovered Writing of Rachel Carson*, edited and with an introduction by Linda Lear (Boston, MA: Beacon Press, 1998), 209.

80 - Carson, *Lost Woods,* 232.

This model was in effect based on high-performance technologies, but the products concerned, from detergents to automobiles, were designed without taking into account the entire ecological system into which they were being introduced.[81] He denounced the vicious circle induced by the use of synthetic fertilizers: "Like an addictive drug, fertilizer nitrogen and synthetic pesticides literally create increased demand as they are used; the buyer becomes hooked on the product."[82] For Commoner, the ecological survival of the human species did not necessarily mean the abandonment of science and technology. It depended on both the development of environmentally compatible technologies—including the "unveiling" of the hidden costs of economic activity, which primarily result in social costs—and a collaboration between scientists and citizens that allows society to freely assess the options available, in order to ensure economic and environmental well-being.[83] The vision of the founders of the IUPN, according to which ecology illuminates issues of conservation, was thus seen to be justified, as it became clearer how human activities disturb the balance of nature. It also resulted in a new type of interaction between science and conservation—alarmism was ultimately justified by research results.

Largely thanks to the North American ecologist Eugene Pleasants Odum, author of an academic bestseller,[84] ecology, still poorly structured at the end of the Second World War, found a theoretical and methodological framework centered on the study of the structure, functioning, and productivity of ecosystems,[85] which provided a scientific reference point for addressing issues of conservation. An international scientific community was formed, driven by the launch in 1964 of the International Biological Program (IBP), under the auspices of the International Union of Biological Sciences. It set the ambitious goal of understanding the biological basis of

81 - Barry Commoner, *The Closing Circle: Nature, Man, and Technology* (New York: Alfred A. Knopf, 1971), 151, 193.
82 - Commoner, *The Closing Circle,* 153.
83 - Commoner, *The Closing Circle,* 189, 195, 198.
84 - Eugene Pleasants Odum, Fundamentals of Ecology (Philadelphia: WB Saunders Company, 1953 (1st. ed.), 1959, 1971).
85 - There is no trace of the ecosystem concept in the proceedings of the technical conference at Lake Success, yet it had been forged as early as 1935 by the English botanist and ecologist Arthur George Tansley. See Bergandi, "Les Métamorphoses de l'organicisme en écologie."

productivity and human welfare, and research was to be devoted to questions of conservation.[86]

The New Environmentalists saw, in the ravages of environmentally unfriendly technologies, the result of a form of scientistic religion, of a total faith in the unlimited power of the human mind, which through the use of science and technology would one day overcome all problems. This anthropocentric "arrogance" was considered by David Ehrenfeld[87] as the primary cause of the ecological crisis. By underestimating the complexity of nature and modeling it from a limited number of variables imagined to be sufficient to solve the problems of implementing new technologies, it encouraged the sequences of adverse events that accompanied attempts to control nature.[88] In addition, for Ehrenfeld, this arrogance arose out of a "conservationist" attitude that allowed natural entities to be seen uniquely as useful "resources." This reductionism implied the negation of any value that cannot be translated into economic terms and led to creating a hierarchy of natural entities based solely on their economic worth.[89] Ehrenfeld unhesitatingly pointed out the contradiction inherent to an idea of nature conservation rooted in such humanism: "There is no true protection for Nature within the humanist system—the very idea is a contradiction in terms."[90]

86 - Edward Max Nicholson, "Conservation," in *The Evolution of the IBP*, ed. Edgar Barton Worthington (Cambridge, UK: Cambridge University Press, 1975), 12–14. Research on conservation aroused less interest among scientists than did the measure of the productivity of ecosystems, perhaps because of the complex and unsatisfactory relations that came about between the IBP and the IUCN, despite the involvement in the IBP of French physician and ecologist François Bourlière, president of the IUCN from 1963 to 1966. See Holgate, *The Green Web*, 93–96.

87 - David Ehrenfeld, *The Arrogance of Humanism* (New York: Oxford University Press, 1978). Paradoxically, according to Ehrenfeld, this humanism, which portrays itself as secular, has its origins in Christian anthropocentrism, which considers that all that exists was created for the benefit of humanity and affirms the superiority of man over the rest of creation. In its de-Christianized form, this ideological foundation continues to be a deep part of modern humanism (7–8). See also Julian Huxley, *Religion without Revelation* (New York: Harper, 1957).

88 - Ehrenfeld, *The Arrogance of Humanism*, 108, and 125–29. It is important to note that ecosystem modeling grew rapidly in the United States in the late 1950s. See especially Frank Benjamin Golley, "The Ecosystem Concept: A Search for Order," *Ecological Research* 6 (1991): 129–38.

89 - Ehrenfeld, *The Arrogance of Humanism*, 176–211. See also Aldo Leopold, *A Sand County Almanac and Sketches Here and There* (New York: Oxford University Press, 1966 [1949]), 246–251.

90 - Ehrenfeld, *The Arrogance of Humanism*, 202. See also David Ehrenfeld, *Beginning Again: People and Nature in the New Millennium* (New York: Oxford University Press, 1993), 117–23.

Environmentalism was concerned not only with local disturbances, but also with the overall effects of population growth on social and ecological equilibria. Paul Ralph Ehrlich, the American biologist who in 1968 popularized the term "population bomb," placed the human population explosion at the heart of the contemporary ecological crisis.[91] Ehrlich pointed out that if the growth of the world population did not slow, increasing demand for food would lead to a profound change in the environment. Major deforestation and the artificialization of hitherto marginal ecosystems would become necessary to increase cultivable areas. In addition, this process would be accompanied by a massive increase in the use of pesticides and fertilizers, which would produce devastating effects on the climate and the diversity of life on the planet.[92] Relations between nations in search of dwindling resources would deteriorate to the point that wars would break out. To avoid such scenarios, Ehrlich advocated strict controls on population growth and increases in food production while minimizing the consequent impact on the environment, along with the restoration of degraded ecosystems.[93]

1965–1980: Development Consolidates, Then Believes Itself Sustainable

At the same time that environmentalism, supported by a thriving ecology, was raising the global issue of the future of the natural world, the relationship between the developed countries and the rest of the world was being challenged, in the context of decolonization. In 1965, the United Nations Development Programme

91 - Ehrlich, *The Population Bomb*.
92 - Ehrlich, *The Population Bomb*, 48–53, 60–61, 95–99.
93 - Ehrlich, *The Population Bomb*, 131. This neo-Mathusian vision was (and continues to be) criticized by those who believe that population growth is always accompanied by technological revolutions that lead to alternative resources. See Julian Lincol Simon, *The Ultimate Resource (*Princeton, New Jersey: Princeton University Press, 1981); Nancy Birdsall, "Another Look at Population and Global Warming," in *Population, Environment and Development: Proceedings of the United Nations Expert Group Meeting on Population, Environment, and Development, United Nations Headquarters, January 20–24, 1992* (New York: United Nations, 1994), 39–54; and Gunnar Myrdal, "Economics of an Improved Environment," in Barbara Ward et al., *Who Speaks for Earth?* (New York: WW Norton & Company, 1973), 67–105. This did nothing to change Paul Ehrlich's position. See Paul Ralph Ehrlich and Anne Howland Ehrlich, *The Dominant Animal: Human Evolution and the Environment* (Washington, DC: Island Press, 2008), 207–10.

was created to provide economic, technical, and financial assistance to developing countries, which, at the time, were referred to as "underdeveloped."[94] For its part, UNESCO, in cooperation with the IUCN and the IBP, began work on an intergovernmental and scientific conference on the biosphere, which constituted a major shift in international thinking. This conference took place in Paris in 1968.[95] While noting that the biosphere has a high capacity for self-regulation, the conference emphasized that this capacity has limits that might well be exceeded. The build-up of carbon dioxide in the atmosphere as a result of industrial activities was (already) being denounced as the cause of the increase in atmospheric and oceanic temperatures, with adverse consequences for the ecological dynamics of the planet.[96] Noting this growing and disturbing anthropization of nature, the conference, in accordance with the Pinchotian concept, advocated the rational use of natural resources, harvesting the "income" without devaluing the "capital".[97] The conclusion of the final report could not be clearer:

> In dealing with both the use and conservation of the resources of the biosphere, the Conference has sought resolution of what at first glance appears to be a contradiction between consumption and preservation of resources of the environment. A resolution seems to have been found in the scientific basis for decisions leading to rational action and in the fact that conservation, while including preservation, has come generally to mean the wise use of resources.[98]

The affiliation that the conference on the biosphere had with the IBP and the IUCN is indisputable, as is demonstrated by the fact that the presidency of the conference was given to François Bourlière.[99]

94 - This is the same United Nations body which, at the Millennium Summit (2000), managed to persuade 189 nations to adopt the Millennium Development Goals, including reducing poverty and child mortality, promoting education, and ensuring environmental sustainability.

95 - *Use and Conservation of the Biosphere. Proceedings of the Intergovernmental Conference of Experts on the Scientific Basis for Rational Use and Conservation of the Resources of the Biosphere. Paris, 4-13 September 1968* (Paris: UNESCO, 1970).

96 - *Use and conservation of the biosphere*, 42.

97 - *Use and conservation of the biosphere*, 112, 122, and 132–33. See also Jacques Grinevald, *La Biosphère de l'anthropocène: Climat et pétrole, la double menace. Repères transdisciplinaires (1824–2007)* (Chêne-Bourg/Geneva: Georg Éditeur, 2007).

98 - *Use and conservation of the biosphere*, 233.

99 - Michel Batisse, "The Silver Jubilee of MAB and Its Revival," *Environmental Conservation* 20 (1993): 107.

However, the IUCN's approach was largely focused on protected areas, sheltered from human activity, while research by the IBP tended to treat man as an "external" factor with regard to the ecosystem. The biosphere conference re-situated humankind at the center. It stressed that the IBP should be followed by an intergovernmental program to develop a more comprehensive approach, to include human ecology, and solemnly called for such a program to be implemented.[100] This was achieved in 1971 with the launch of the Man and Biosphere Program (MAB). The program, which was the belated realization of the goals of the Lake Success technical conference, focused on the creation of "biosphere reserves": these were spaces for interdisciplinary research aiming to provide a scientific basis for the conservation and rational use of nature, and simultaneously intended to promote educational activities,[101] as well as, increasingly explicitly, the development of the populations living in these areas. The biosphere conference thus established a new vision of development, which prefigured the concept of "sustainable development."[102] Its objective was to find a scientific basis for this development, with the aim of reconciling preservation and conservation. It could not therefore demarcate itself from scientism, including in its vision of the role of the humanities, which in its view was the only source of "wisdom" beyond the purview of the natural sciences, as is shown by this passage of the final report:

> While the facts derived from biological and physical sciences are indispensable, as are the technologies based upon them, they are by themselves insufficient for wisdom. The social sciences must be considered also because of the roles played by economics, politics, administration, law, sociology, and psychology, for man is the key component of the biosphere.[103]

Four years later, in Stockholm, the United Nations Conference on the Human Environment (UNCHE) laid the foundations of the United Nations Environment Programme (UNEP), with the remit of treating all issues related to a global ecological equilibrium and providing scientific and technical support to governments in

100 - *Use and conservation of the biosphere*, 205, 211–12.
101 - We must not forget that the IUPN, created with the strong involvement of UNESCO, made education, to which a large part of the technical conference at Lake Success was dedicated, a priority.
102 - Batisse, "The Silver Jubilee," 108.
103 - *Use and conservation of the biosphere*, 233–34.

order to reach an international consensus on environmental issues. Following the Stockholm conference, the IUCN, with the UNEP and the World Wildlife Fund (WWF), engaged in the preparation of the World Conservation Strategy. Published in 1980, the Strategy was the first official international document in which the expression "sustainable development" appeared, translated as "*développement durable*" in the French version.[104] The World Conservation Strategy, looking for a "new international economic order" (Article 1, § 2), saw in conservation and development two interrelated aspects: economic development improves human lives, while conservation allows development to gain sustainable access to the resources of the biosphere (1.5, 1.10). In this context, "development" is defined as "the modification of the biosphere and the application of human, financial, living and non-living resources to satisfy human needs and improve the quality of human life" (1.3) and "conservation" as "the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations" (1.4). This perspective, perfectly "Pinchotian" in nature, was presented with an ethical concern, with the text using the now classic expression: "We have not inherited the earth from our parents, we have borrowed it from our children" (1.5). In addition, according to the World Conservation Strategy, humanity, having become an important factor in evolution, has a moral obligation to act with caution not only in regard to its own descendants, but also in regard to other species. Indeed, it is explained (3.2) that it is impossible to predict which species will be crucial to our future development, or which may play a key role in the balance of future natural systems. Thus, the *preservation* of nature, in all its diversity, becomes *useful*, by subordination, to *conservation*.

104 - The document, prepared by the IUCN, in cooperation with the UNEP and WWF, as well as the Food and Agriculture Organization and UNESCO, is entitled *World Conservation Strategy: Living Resource Conservation for Sustainable Development* (Gland, Switzerland: IUCN, 1980).

The Principles of Sustainable Development: A New Global Political Order, Based on the Natural Sciences

The concept of sustainable development has evolved through successive international texts since the Stockholm Conference (UNCHE, Stockholm, 1972), up to and including the World Summit on Sustainable Development (WSSD, Johannesburg, 2002), via the World Conservation Strategy (1980), the report of the World Commission on the Environment and Development (WCED, 1987),[105] and the United Nations Conference on Environment and Development (UNCED, Rio de Janeiro, 1992), at which the Convention on Biological Diversity was signed. Developed over four decades, the international declarations and agreements that were produced should be considered as a single corpus, which will be expanded to include the output of the United Nations Conference on Sustainable Development (UNCSD, Rio +20) to be held in Rio de Janeiro in June 2012.

The new international economic order corresponding to the model of sustainable development is based on one observation—that there is a crisis, both environmental and economic, which is a threat to the integrity of ecological systems and the health of human populations.[106] To overcome this crisis, development programs cannot be limited to the economic dimension, but must also integrate ecological and social dimensions to ensure the well-being of human populations,[107] with financial and scientific support designed to enable developing countries to optimize their production processes and ultimately to eradicate poverty.[108] Sustainable development should allow both the "conservation" of natural resources and an equal distribution of the fruits of economic growth,[109]

105 - WCED, 1987, *Our Common Future*, (Oxford, New York: Oxford University Press, 1987).
106 - UNCHE, 1972, *Declaration*, Preamble § 3, 4, Principles 2, 4.
107 - UNCHE, *Declaration*, Principles 10, 13, 14, 15; WCED, 1987, *Our Common Future*, 37–42, 62–65, 90.
108 - UNCED, 1992, *Declaration*, Principles 6, 7, 9; Convention on Biological Diversity, UNEP, *Handbook of the Convention on Biological Diversity* (London: Earthscan Publications, 2001), art. 12, 13, 15, 16, 17, and 18.
109 - WCED, 1987, *Our Common Future*, 67–69, 219–25, 307–12; UNCED, Principles 8 and 9.

provided that population pressure is controlled, in order to maintain the planet's highest level of biodiversity.[110]

Populations, regardless of their cultural or social background, should be able to meet their basic needs (food, health, education, employment, and so on).[111] Political-economic decisions should therefore take proper account of environmental factors,[112] as well as new technologies, such as those that may help in the fight against climate change.[113] The precautionary principle applies as the moral principle guiding all human action, to avoid harm to both populations and the environment.[114] However, if any damage is going to occur, the "polluter pays" principle should ensure that an affected community is not passively subject to any damage incurred to its environment or to its well-being, but can instead expect to be compensated at the expense of the polluter. Better still, the costs of environmental protection should be internalized in any and all economic activity.[115] Finally, people should be informed of economic projects that could jeopardize their interests and should have the power to refuse them. More broadly, sustainable development involves the establishment, at the global level, of a truly democratic system, which allows people to decide their future by intervening directly in economic and environmental decisions.[116]

The ecosystem approach has been put forward as the most appropriate tool to ensure the integrity of ecological systems, the balanced management of development, and the well-being of humankind.[117] Overall, the international community increasingly relies on scientists to clarify its understanding of the state of the planet

110 - UNCHE, *Declaration*, Preamble § 5, Principle 16; WCED, 1987, *Our Common Future*, 11, 69–73, 128–30.
111 - UNCED, *Declaration*, Principles 1, 5; *Report of the World Summit on Sustainable Development* (WSSD), 2002, *Declaration*, Principles 18, 19.
112 - UNCED, *Declaration*, Principles 7, 10; WSSD, *Declaration*, Plan III, 20, XI, 138, 139.
113 - *UN Framework Convention on Climate Change* (UNFCCC), 1992, art. 2, 4 (b, c, f, g), 5; Daniel Sitarz, ed., *Agenda 21: The Earth Summit Strategy to Save Our Planet* (Boulder, CO: EarthPress, 1993) (hereinafter abbreviated Ag 21), 9.2, 9.6, 9.7, 9.8, 9.11, 9.12.
114 - UNCED, *Declaration*, Principle 15; WSSD, *Declaration*, Plan X, 109.
115 - UNCED, *Declaration*, Principle 16.
116 - UNCHE, *Declaration*, Preamble § 7, Principle 1; WCED, 1987, *Our Common Future*, 8, 330–32, 339; UNCED, *Declaration*, Principle 10; Ag 21, 263–64, 296–98; WSSD, *Declaration*, Principles 15, 31, Plan XI, 138, 139.
117 - See the 5th COP Decision V/6, Nairobi, in Convention on Biological Diversity, UNEP, *Handbook of the Convention*, 2001.

and to anticipate possible future developments. The most famous example is of course the Intergovernmental Panel on Climate Change (IPCC), which was established in 1988 under the auspices of the United Nations, the World Meteorological Organization, and the UNEP. The mission of this scientific panel is to assess scientific, technical, and socio-economic information relevant to climate change, and to develop the most plausible scenarios for future change, based on elements agreed to within the scientific community. Less known to the public, from 2001 to 2005, the Millennium Ecosystem Assessment mobilized more than 1300 experts at the request of the United Nations' secretary general to assess the consequences of ecosystem change for human well-being, and to clarify the scientific basis on which to build in order to restore, conserve, or enhance the sustainable use of ecosystems.[118] The title of the summary report published in 2005, *Ecosystems and Human Well-Being*, makes a direct link between the primary objective of humankind and the ecological systems that form the fabric of the biosphere. It seems certain that the international community can no longer imagine the future of humankind without the support of ecology.

Conclusion

In the nineteenth century, with his scientifically-based approach, Marsh identified certain processes that constitute what we now call the environmental crisis. He showed that progress came about by a war against the order of nature, with the irrational use of natural resources being the primary cause of an inevitable deterioration in climate and the balance of nature. His analysis concluded with a warning that these changes might have adverse consequences for the human species and the planet as a whole.

Pinchot and Muir were Marsh's direct successors, but between these two representatives of the American environmental movement there existed an irreducible philosophical, ethical, and political opposition. According to Muir,[119] the "smiling philanthropy" of Pinchot hid corporate interests, while Pinchot saw Muir's attitude

118 - *Millennium Ecosystem Assessment, Ecosystems and Human Well-Being: Synthesis* (Washington, DC: Island Press, 2005).
119 - John Muir, "The Hetch Hetchy Valley," *Sierra Club Bulletin,* 6 (January 1908).

as nothing more than an expression of "sentimental nonsense."[120] The divide between the conservationist pragmatism of Pinchot and the preservationist idealism of Muir has never been overcome. To the heirs of Pinchot, nature is an "object" in the service of humanity, and humans are the only "subjects" able to assign meaning and value to nature. To the heirs of Muir, however, nature, even if it allows the survival of humanity, has primarily an "intrinsic value," quite independent of any human assessment, interest, or need—its existence is an end in itself.

At the founding of the IUPN, preservationists may have hoped to work for the preservation of the wildernesses, but they nonetheless clearly signed a conservationist text. Even today, nongovernmental organizations work to ensure that certain tracts of wilderness are spared the grip of "progress," but, having procured an "alibi" tract here and there, they paradoxically promote the artificialization and fragilization of ecosystems everywhere else. Few activists ever understood that the "economization" of nature would lead to the marginalization of any and all values other than those that are ultimately utilitarian in political debate. In fact, today, attempts to "monetize" the components of biodiversity accord intrinsic value to a derisory fraction of all species, as a concession to keep the preservationists from becoming too cranky.[121]

In a context of widespread awareness of the existence of an environmental crisis, the scientific community is looking for the correct position. At the heart of the international movement for the protection of nature, scientists have continued to raise public awareness about the risks that human activities pose to the living world. In the early twentieth century, they were mainly concerned with the risk of the disappearance of species and spaces of "scientific interest." Over time, thanks in particular to the development of the science of ecology, which has brought a conceptual framework to the idea of natural equilibria, along with methods to characterize disturbances

120 - See William C. Everhart, *The National Park Service* (Washington, DC: Praeger Publishers, 1972), 16.

121 - See in this regard the report of the committee chaired by Bernard Chevassus-au-Louis, *Approche économique de la biodiversité et des services liés aux écosystèmes: Contribution à la décision publique* (Centre d'analyse stratégique, Premier ministre [Strategic Analysis Centre of the Prime Minister], April 2009).

in them,[122] the scientific community has taken up Marsh's position anew, which is to warn of the risk of ecological changes harmful to the biosphere, including its human inhabitants. Meanwhile, the international community has recognized the legitimacy of the role scientists have in monitoring and providing warnings.[123] But the natural sciences, ecology in particular, are currently experiencing a major paradigm shift.[124] A discourse had long prevailed that nature would "naturally" find its balance as long as humans avoided disrupting its harmony. Now all science shows that the Earth was, is, and will ever be changing. Until now life—the fruit of and a causal factor in global change—has survived only through its capacity for adaptation, always changing, entirely dependent upon its diversity. Within this paradigm of mutual adaptability of life and the planet that is its home, should not the goal of human society, therefore, be to ensure the sustainable adaptability of the biosphere by working to prevent its permanent artificialization?[125]

The model of sustainable development, prefigured by Pinchot and Roosevelt's philosophical and political position, failed to transcend the preservation / conservation dichotomy. Indeed, it presents two major contradictions that are more than simply an oxymoron, more than a mere rhetorical juxtaposition of the idea of *development*, implying change, with the idea of *sustainability*, implying permanence. If these contradictions are not overcome, sustainable development will remain long, if not forever, an empyrean utopia, or it will end in failure.[126] These contradictions produce a dual tension, at both the ethical and political level. We can summarize

122 - See Patrick Blandin, *De la protection de la nature au pilotage de la biodiversité* (Versailles, France: Quæ, 2009), 36–42; Patrick Blandin, "Ecology and Biodiversity at the Beginning of the Twenty-First Century: Towards a New Paradigm?" in *Ecology Revisited: Reflecting on Concepts, Advancing Science*, eds. Astrid Schwarz and Kurt Jax (Dordrecht, Netherlands: Springer, 2011), 205–14.

123 - The creation of the Intergovernmental Panel on Climate Change (IPCC) is the proof of this, along with the decision of November 2008 to create a similar body on biodiversity—the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). This decision followed a process initiated at the international conference held in Paris in January 2005, "Biodiversity: Science and Governance."

124 - See Blandin, *De la protection*, 51–55.

125 - See Patrick Blandin, "Développement durable ou adaptabilité durable? De la nécessité d'une éthique évolutionniste," in *Les Enjeux du développement durable*, Patrick Matagne, ed. (Paris: L'Harmattan, 2005), 27–45.

126 - See Donato Bergandi, "Lo sviluppo sostenibile tra utopia e realtà politica", in Almo Farina, Massimo Russo, eds., *I Nuovi paradigmi dello sviluppo: Scienze sociali e scienze ecologiche a confronto* (Trieste, Italy: Goliardica Editrice, 2009), 9–36.

them as follows: "Conserving natural resources is not preserving nature"; and "well-being and the integrity of biodiversity are not compatible with the interests of economic groups whose sole purpose is to generate profits as quickly as possible, without regard to the resilience of the ecosystems involved or the equitable redistribution of the wealth produced."

The first contradiction is ethical. Anthropocentric, sustainable development indicates an asymmetrical relationship between humans and the rest of nature. This was strongly expressed at the Stockholm conference: "Of all things in the world, people are the most precious."[127] However, the Convention on Biological Diversity grafted an eco-centric offshoot onto this anthropocentric base—it took the risk of recognizing that biodiversity also has a non-instrumental value. In the preamble, the signatories declared that they were aware of the value of biological diversity not only in the ecological, genetic, social, economic, scientific, educational, cultural, recreational, and aesthetic realms, but also of its intrinsic value. We find here a kind of fossilized trace of the preservationist ethic. In reality, anthropocentric values always prevail. Furthermore, economic utilitarianism generally takes supremacy over all other forms of utilitarianism, whether recreational, aesthetic, or scientific. The risk therefore remains of a highly destructive anthropocentrism.[128] Supporting both the intrinsic value of natural systems and their economic value is therefore a rather makeshift ideological construction, and certainly not a new policy vision of the relationship between humanity and nature. Sustainable development is an ethical oxymoron.

The second contradiction is not limited to expressing the distance between the ideal and the reality. It reflects one of the most confusing aspects of the sustainable development model. The "new

127 - UNCHE, *Declaration*, 1972, 5. See also Miguel A. Ozorio de Almeida's position: "The subject for whom the environment is to be preserved or improved is man and his legitimate interests." (Ozorio 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, Switzerland, June 4–12, 1971 [Paris and The Hague: Mouton, 1972]: 113).

128 - For instance, a misanthropic eco-centrism that puts a greater value on the planet's ecosystem than on humanity would be the counterpoint. See Donato Bergandi, "Écologie, éthique et holisme ontologique," in *L'Éthique environnementale*, Anne Fagot-Largeault and Pascal Acot, eds. (Evreux, France: Sciences en situation, 2000), 65–79.

international economic order" that sustainable development hopes to forge should ensure equal access for all to natural, financial and cultural resources, regardless of sex, age, or social status. The achievement of sustainable development therefore requires the global extension of a genuinely democratic political model that ensures the effective participation, as direct as possible, of populations in politico-economic and social decision-making. It requires, at the very least, regulatory systems to avoid market distortion rooted in the advantageous positions acquired by transnational corporations. This is a formidable problem of governance, of which Pinchot and Roosevelt were well aware. Today, the need is clear for transparent, national, and even international governance, enforcing environmental and social rules that express the will of the people. The rules enforced should not simply be the result of pressure by industrial and financial groups upon politicians unmindful of the interests of the citizens who elected them, or subservient to the interests of industrial and financial groups unmindful of the ecological limitations of the planet.[129] Otherwise, if the current development model endures, the biosphere will continue to lose its evolutionary potential, and the oxymoron of "sustainable development" will become nothing more than a kind of ineffective religious mantra. Or it could wind up as a highly effective and intoxicating advertising slogan that conveys the idea that everything must change, while in reality development continues in direct contradiction to the entirely imaginary world of "sustainability."

129 - For the role played by transnational economic groups in the allocation of financial and natural resources, both in the socialization of economic losses and in the determination of national and international public policy, see Noam Chomsky, *World Orders, Old and New* (New York: Columbia University Press, 1994).