

The Crisis of Global Capitalism and the Environment

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Abstract

On the basis of a long tradition of studies on the relationship of humanity to the natural environment, the progressive worsening of environmental conflicts has led to the intensification and renewal of the debate, in the context of the current systemic crisis. Shortages, increased value and depletion of non-renewable resources (materials, soil, fossil fuels) and renewable (water, air, agro-forestry products, biodiversity, environmental quality, landscape) resources is interpreted in different ways under different approaches to the nature-society dialectic and contradictory assessments of the capitalist system. Against this background, this paper examines the debate on the relationship between human causes for the deterioration of the physical and ongoing and long term socio-economic processes. Is there really a fundamental dependence of the socio-economic realm on the environment? Of what nature, of what environment are we speaking? Under which time scales and spatial differentiations occur these relationships? These are some of the questions that constitute this paper.

Introduction

The examination of the limits of growth and critique of the concept of “sustainable development” has undergone a major intensification in recent years. The current debate is based on already existing studies, of which the work of Kenneth Boulding (*The Economics of Coming Spaceship Earth*), Nicholas Georgescu-Roegen (*La degradation entropique et la technologie destinée prométhéenne de la humaine*), Herman Daly (*Beyond Growth: the Economics of Sustainable Development*), André Gorz (*Capitalism, Socialism and Ecology*), Ernst Friedrich Schumacher (*Small is Beautiful*) or the *The Limits to Growth* (1972), without ignoring the agreements and disagreements among them, are fundamental.

Among the landmarks of this long reflection it is inexcusable to place the historic 1955 symposium *Man's*

Role in Changing the Face of the Earth at Princeton. This seminar, sponsored by Carl O. Sauer, Lewis Mumford and Clarence Glacken, was a landmark in the study of man's role in the transformation of the Earth's surface. Paradoxically, its central message - the importance of the relationship between humanity and the environment as a central topic of study - was ignored, if not rejected, by geography during subsequent decades. Thirty years later, another symposium was held at Clark University in 1987, dedicated to *The Earth as Transformed by Human Action* with a similar goal and, like the previous one, organized by geographers but with a decidedly interdisciplinary character (Capel, 2003).

Contributing to key issues in this debate, among Spanish authors who stand out, are the works (and intervention in social and political action) by José Manuel Naredo in *Raíces económicas del deterioro ecológico y social: Más allá de los dogmas* (Economic roots of social and ecological deterioration: Beyond the dogmas), Antonio Estevan in *Hacia la reconversión ecológica del transporte en España* (1996) (Towards the Ecological conversion of transport in Spain), *Herencias y problemas de la política hidráulica española*, (2008) (Legacy and problems of Spanish water policy) Jorge Riechmann in *Gente que no quiere viajar a Marte: Ensayos sobre ecología, ética y autolimitación* (People who do not wish to travel to Mars: Essays on ecology, ethics and self-restraint) and by Joan Martínez Alier in *De la Economía Ecológica al Ecologismo Popular* (From Environmental Economics to Popular Environmentalism).

The current boom in demand for rigor in the analysis of the development process has been maturing for a long time, having deep roots in the thinking represented by the authors cited above. This new demand for rigor occurs also parallel to the emergence of the debate in new sectors of social actors (political, civic, and labour agents). What until recently was a two-way debate (a respected minority on one hand that is academic and intellectual in focus, and an 'environmentalist' discourse with plenty of media coverage, but either trivialized or marginalized, on

the other hand) finds some resonance in broader areas and relatively more representative of social diversity. The need to combat environmental rhetoric, a demand for in-depth analysis based on indicators of matter, energy, metabolism and the ecological footprint, but also on real involvement, cohesiveness, social inclusion and landscapes, have also permeated, as evidenced by the work of Juan Ojeda Rivera (Ojeda, 1999 and 2011) and the debates raised by the Informe de Desarrollo Territorial de Andalucía (Territorial Development Report of Andalusia) team (Zoido, 2001, Caravaca y Zoido, 2006 y Pita y Pedregal, 2011).

It is true that, while it almost coincided with the emergence of this revival of critical thinking on development, the global crisis that was triggered in 2008 and especially affected the wealthier countries (Europe, USA) has created new priorities (mass unemployment, an unravelling welfare state, evictions, widespread poverty...). These new priorities have led to an obsession with the need to revive growth, even as measured by conventional parameters such as Gross Domestic Product (GDP), long in use. The reaction to the crisis and its aftermath has brought to the surface, with resistance from the hegemonic neo-liberal doctrines, approaches that place a high priority on public investment, economic recovery and growth. These approaches are well represented by Nobel Prize-winner Paul Krugmann (2009) and Joseph Stiglitz (Griffith-Jones, Ocampo and Stiglitz, 2010) and the Spaniards Juan Torres and Vicente Navarro (Navarro, Torres and Garzón, 2011). These authors do not ignore, of course, the need for a new development model (e.g. alternative energy model, green job sites), but the core of their thinking and priority proposals stem from the logic of conventional economic growth.

But today, the opinion is commonly accepted that the younger generations will be worse off than their parents. As of about 20 years ago, the amount of wage income that is disposable has experienced a downward trend, despite the increase in employment. Core countries are “degrowing” in a deep and disorderly fashion: this is the meaning of ‘recession’, i.e. the deterioration of working conditions, income, access to goods and services that is not distributed evenly, whether in social or spatial terms, among the population. This process is accompanied by an increase in inequality, an increasingly important category in today’s world. Accumulation of wealth on the one hand and precarious living conditions of another brings about polarization.

But does the crisis mean reduction in pressure on ecosystems and natural resources? Are they improving the condition of the environment? Or rather, are the

changes to the deterioration (entropy changes) of this physical medium the key fundamental explanatory factors of existing processes and long-term structural trends? Is there really a fundamental dependence of socio-economic dynamics on the physical environment? Can humanity survive and in good living conditions despite the deterioration of ecosystems? Of what nature or of what environment are we speaking?

These are not rhetorical questions, because there is much controversy in the sciences –physical, natural, and social– regarding the responses to them.

Advance warnings of disaster

The above-mentioned school of thought believes that the exponential growth that humanity has known since the incorporation of fossil fuels into society’s metabolism is a transitory phenomenon in human history that is coming to an end. We are the only species so far that has exceeded (artificially) the ecological limits (Georgescu Roegen, 1977, Naredo, 2007, cited by Fernandez Duran, 2011:94). That is precisely, overwhelming its natural and physical limits, the characteristic of the human species, could be argued. But this way of acting, in the historical context of industrial civilization (from the first industrial revolution as defined by the onset of the steam engine) is made material by way of a metabolism mainly supported by “the removal of rocks and minerals from the earth’s crust instead of derivatives of photosynthesis as do the other species of the biosphere, as was practised by the human race throughout its history, (Naredo and Valero, 1999:21). And this metabolism of industrial society advances towards a growing deterioration of the planet’s resources, accompanied by increasing social and spatial polarization. In the works of José Manuel Naredo and Antonio Valero on the evolution of the earth’s crust, its water and atmosphere, and the status of entropy to which our planet is tending, the composition of maximum entropy state towards which our planet, tends expressed clearly that “life arose and evolved from Earth, as they say, from a “primordial soup”: industrial civilization is headed towards a “posthumous purée” in which all of the materials of which is composed would be scrambled”(Naredo, 2011:27).

However, from a practical-political perspective, it is important to consider the spatial and temporal scale at which this “entropic collapse” will arise. In this regard, the following opinion of Robert Solow expresses an underlying category which supports tacitly the collective “common sense” when it ignores the consequences (how soon?) of the deterioration of natural-physical and social life. Asked

“whether, in his opinion, the material transformations which economic activity requires are constrained by the law of entropy,” he replied and acknowledged that “there is no doubt that everything is subject to the law of entropy”, but said “there is no immediate practical importance to model what is ultimately a very short time in a small corner of the universe” (Naredo and Valero, 1999:25). The problem is that in this response, Solow identifies the law of entropy with the remote, hot and final death of the universe; but this law has immediate and important implications of the following type: you cannot burn the same piece of coal twice. When coal is burned, useful heat is obtained, as well as soot, ash, CO₂ and waste heat. There are limitations to the efficiency of conversion from one form of energy to another, as well as practical limits to the recycling of materials (Daly, 1999:23).

More than ten years ago Ulrich Beck, although from another perspective, as we shall see, wrote that collective life patterns, progress and control capacity, full employment and exploitation of nature typical of the *first modernity*, have been undermined by five interrelated processes: globalisation, individualisation, gender revolution, underemployment and global risks (such as the ecological crisis and the collapse of global financial markets). The real challenge political and theoretical of the *second modernity* is the fact that society must simultaneously meet all these challenges (Beck, 2002 (1999): 2).

As a result of this situation, a growing number of men and women are forced to consider the future as a threat, and not as a shelter or a land of promise. Worldwide, simultaneously, “fragile jobs” increase rapidly, i.e.: part-time work, self-employment, temporary contracts and other forms of work for which we have not found adequate descriptions yet. In 1999 Ulrich Beck warned that if this dynamic continued, in ten or fifteen years (i.e., between 2009 and 2014), about half the population of the West will work in conditions of uncertainty. Certainly, no one can say that Beck, who wrote during the ‘dot-com’ boom, was mistaken. What used to be an exception was becoming, more than ten years ago, when Beck was writing, a norm that means no choice but to decide between: a) social protection for the growing number of poor at the expense of high unemployment, and b) accept the poverty of large segments of the population, to achieve a slightly lower unemployment rate. Endemic uncertainty is what will characterise the basic existence of most people –including apparently well– off middle classes, in the coming years, announced years before the current crisis (ibid. 16-19).

Some authors describe this perspective vividly and concretely. According to Ramón Fernández Durán, people

of the core countries who will endure a profound crisis over the next two decades (2010-2030) are in a range of age cohorts located between the generation of 1968, who will soon leave behind their working (business) life, and the so-called “best-educated generation in history”. The first of these two generations, which has lived in opulence because of cheap oil, may reach the end of its life cycle in a state of penury, but may be in good stead since most of them are homeowners or live in protected rental housing, in addition of benefiting from the still existing welfare state. But the next two generations, i.e. those currently in the 40-50 age range and in the 20-30 age range, will bear the burden of the “collapse of global capitalism”. Finally, the generation being born today will be only about 20 years old in 2030 (when after “peak oil” peak coal will arrive), and thus begin adult life in a severe crisis. In childhood, that group would have survived several crises, only to face the collapse of global capitalism and the “long decline of industrial civilization” that will begin after it (Fernández Durán, 2011:88-89).

Other authors share this view. This is the case with Richard Heinberg, who believes that factors external to the financial economy make the recovery of conventional economic growth virtually impossible. There are three basic factors that are strongly opposed to “recovery of growth”: the depletion of important natural resources, including fossil fuels and some minerals, the proliferation of environmental impacts from both the extraction and use of resources (including fossil fuel combustion), leading to rising costs driven by their own impacts and efforts to prevent and remedy them, and the short circuits resulting from the inability of monetary and financial systems to adjust to limited resources and rising environmental costs (Heinberg, 2011)

The previous reflection is set in a backdrop for discussions along a longer time scale. According to Prof. Joseph Tainter of Utah State University, complex societies have been unable to address the recurring crisis of civilization throughout history, and fell into deep crisis or collapse for different reasons. This is what Tainter calls “the collapse of complex societies”: under certain historical conditions, socio-political organizations face increasingly complex problems simply to maintain their status quo. In these circumstances, increased investment in maintaining the complexity achieved thereby results in increased costs of various and unmanageable natures, according to the law of diminishing returns applied to institutional structures. In addition, complex societies are large consumers of energy and resources. And when the marginal utility of any new investments in complexity becomes negative, the collapse and the transition to a less complex situation of socio-political and structural disintegration becomes

an unavoidable alternative. In this regard, the twentieth century could have been one of global expansion, integration and complexity, largely destroying local diversity, all thanks primarily to fossil fuels. By contrast, the twenty-first century could see global contraction and simplification, but not local, that may flourish, while the depletion of fossil energy continues (Tainter, 1988).

On occasion, the elites of these civilizations proposed counter-productive measures for crises they encountered and precipitated a quicker collapse (Tainter, 1988). This time may not be different: we could be witnessing the failure of the power structures to anticipate and react to the crisis of industrial society. The attempt to maintain the policies of the growth phase (promotion of the large-scale, urbanization, speed, specialization and competition) beyond the peak of industrial civilization, even though such policies have adapted well to the ascending phase, may result in further deterioration of living conditions, as well as institutional and environmental conditions. These erroneous reactions would inhibit a hypothetical decrease or orderly transition that would instead bring about a more abrupt collapse (Fernández Durán, 2011:71-73).

In any case, having fulfilled the perspectives of these “visionaries”, the crisis of industrial civilization would not be a sudden and uniform process, but a long, complex and differentiated one, with possible ups and downs, but always on a slope towards increasing decadence. This is what John Michael Greer (2008 and 2009) has called the “long decline of industrial civilization.” This would be characterised by increasing and widespread blackouts by 2030 and crises in transport systems and the management of large cities, science and technology, social and cultural organization and institutional structures, value systems, social ethics, world-views, etc. The *progressive collapse* of industrial civilization would be a slow process with ups and downs, uneven spatially, but also with major breaks (Greer, 2008).

But despite all of these plausible predictions, rooted firmly in the heart and mind of industrial society is the belief that our civilization will not succumb as others have in history. And even less so with regard to global capitalism, and especially *the society of images, information and communication*: its last and most dazzling conquest. “The words *decline* or *reversal* have been banished for over 300 years, first in the West, and then the whole world, as the dynamics of modernisation have reached the most remote places on the planet” (Fernández Durán, 2011:78).

Today, the faith in unlimited progress is stronger in the new emerging countries (China, Brazil, Turkey...) and much of the Global South, even while the West

is witnessing its decline. But this faith in progress is maintained primarily on the basis of constructed reality fomented by mass media, which is still able to hide what happens in actual reality. However, it is reasonable to think that in these next two decades, it will become clear that it is impossible to generalize the Western way of life over the whole planet. Clearly, this idea has been an illusion that lasted only a few tens of years. “A mirage sustained by the plunder of Gaia and global exploitation, thanks to a hyper-technological society that will begin to come to an end” (Fernández. Duran, 2011:81)

Criticism of the “ecology of fear” and emphasis on political action

In summary, numerous voices are warning that the Earth and many of the areas that compose it are mired in an ecological conflict that can short-circuit human society in the not too distant future if urgent and immediate action is not taken to bring Nature back to a more benign state of equilibrium. They are also known critiques of these approaches defined by productivist and “techno-utopian” mythologies. The most renowned work in the last decade is the book of Bjorn Lomborg, *The Sceptical Environmentalist*, which was brought about, says the author, in an interview with the American economist Julian Simon, a quote of whose opens the book: “This is briefly, my long-term prognosis: the material conditions of life will continue to be better for most people in most countries, most of the time, indefinitely. Within one or two centuries, all countries and most of humanity will be at or above current Western living standards. However, I also believe that then many people will continue thinking and affirming that living conditions are getting worse” (cited by Lomborg, 2003:9). It conveys the same message of Paul Roberts who, in his documented study *The End of Oil: On the Edge of a Perilous World*, says: “In fact, during the coming decades, it is very likely to see all sorts of technological advances that have nothing to do with oil nor with solar or wind power. Advances that most of us, raised in the era of oil, we cannot possibly begin to imagine, very important advances will come from totally unexpected areas” (Roberts, 2004 (2004): 308). But in these pages we will not focus on this line of criticism to the heralds of catastrophe, but instead the criticism that comes from critical social theory.

From this perspective, Erik Swyngedouw claims that environmental problems are generally presented as threats to the survival of the human species, announcing the early end of civilization as we know it, along the lines of what Mike Davis wrote about in *Ecology of Fear: Los Angeles and the Imagination of Disaster*. The fear,

according to this perspective, is crucial to the current environmental narrative, “a fear stemming from the threat of socio-ecological collapse at some future time, fuelled by furious debate about the exact date of his arrival”(Swyngedouw, 2011:50).

The effects of these Domsday approaches, which are founded upon a vision of Nature as a source of goods, are counter-productive, according to this author: the illusion of imagining a benign Nature avoids having to formulate the politically sensitive but vital question about the solutions we wish to reach, how we can achieve them and what sort of surroundings do we wish to inhabit, while recognizing at the same time radical and unpredictable Nature. An environmental policy based on a unified vision of Nature, that is ontologically stable and harmonious is necessarily a policy that eradicates the “political” debate about what to do with the Natures that actually exist. The benign view of Nature threatened by apocalyptic disasters, says the author, provides a *post-political* passage through fear and driven by a concern to preserve what we have today (ibid. 52-53).

Consistent with this finding, Erik Swyngedouw, following Alain Badiou and Slavoj Zizek, insists that “ecology has become the new opium for the masses, replacing religion as the axis around which revolves our fear of social and ecological disintegration, but also from which redemption may arise, if enough attention is paid to the premonitory warnings “(ibid.: 51). By contrast, the key policy question should be “what kinds of Natures do we want to preserve, build, or if necessary, wipe off the face of the planet (e.g.: HIV) and how to achieve the new situation” (ibid. 60).

Behind these approaches is a profound reflection on Nature, with obvious implications for environmental policy. In this debate, the author Ulrich Beck, whose complex thinking prevents a simplistic characterization, as previously noted, remains an undisputed reference point: “My thesis is that we now have an ‘Earth policy’ that we did not have some years ago, and that can be understood and organized according to the dynamics and contradictions of a society with global risks. What is environment? What is Nature? What is ‘virgin land’? What is ‘human’ in human beings? These questions and others like it must be remembered, re-thought, reconsidered and re-discuss in a transnational context, although no one has the answers.” (Beck, 2002 (1999): 13).

In order to conduct sociological analysis of environmental problems, Beck proposes a conceptual framework that allows understanding them not as problems of the *natural environment* or the outside world around us, but

of the inner world of society. Instead of the apparently obvious key concepts, e.g.: “nature”, “ecology” and “environment”, which are based on opposition to the social, the proposed framework goes beyond the dualism of society and nature “(ibid.29-30). Because today, more than ever, Nature is not nature: it is a concept, standard, memory, utopia, and an alternative plan. Nature is rediscovered, and indulged, in a time that no longer exists. In the environmental debate, attempts to use Nature as a banner in defiance of its own destruction are based on a *naturalistic fallacy*. For the Nature so invoked no longer exists “(ibid.32-33).

For sociological analysis of environmental problems, Beck proposes a conceptual framework that captures not problems of the environment or the world around us, but the *inner* world of society. Instead of the key concepts, seemingly obvious “nature”, “ecology” and “environment” based on opposition to the social, the proposed framework starts beyond the dualism of society and nature (ibid. 29-30). Because today more than ever, nature itself is not nature, it is a concept, a standard, a memory, a utopia, an alternative plan. The nature is rediscovered, spoiled, in a time that no longer exists. In the environmental debate, attempts to use nature as a standard against its own destruction are based on a naturalistic fallacy. For nature invoked no longer exists “(ibid. 32-33).

But if nature “in itself” does not constitute the analytical reference point for the ecological crisis and for a critique of the industrial system, what, then, can play that role? The most common answer is: the *science of nature*, according to which and through certain technical formulas - indicators of pressures, impacts on air quality, water, or soil, climate models and feedback loops of simulation models of all types of ecosystems - can gauge whether the damage to ecosystems is tolerable or not. This approach, however, has at least three drawbacks. First, it leads directly to “ecocracy” which differs from technocracy to the fullest extent of its power (global management), crowned by the satisfied conscience that characterises it (Beck, 2002: 33-34). Swyngedouw is in agreement with this criticism, denouncing the aristocracy of natural sciences that are supposedly neutral in their opinions but actually mixes or even exchanges ‘facts’ and ‘values’, without appropriate public policy mediation. Thus, these specialists directly interfere in the realm of *politics* and, as expert managers, thus become an integral part of institutions and forums for formulating policies (Swyngedouw, 2011:53).

Second, from this critical perspective, it is considered that the *science of Nature* ignores the importance of cultural perceptions or of conflict and intercultural dialogue,

explaining that the same kind of hazards will occur in very different ways according with these different contexts. Moreover, these approaches to environmental issues by *natural science* involve hidden cultural models of Nature. The consequence is that no expert can answer the key policy question: How should we live? What people are or are not willing to accept is not derived from any technical or environmental hazard assessment, but, rather, should become the subject of global dialogue between cultures (Beck, 2002:33-34).

But, while the essentialist-realist and constructivist approaches may be contradictory as to methods and assumptions, both agree on the diagnosis of the current situation, which is characterized as the society of global risk. Realism, certainly, emphasizes the global risk society and the constructivism of global risk society. We could say, Beck explains, that realism conceives of environmental problems as “closed”, while constructivism maintains in principle its opening. For one, it is the danger (total disaster scenarios) posed by the global risk society which constitute the main focus, while for other it is opportunities and contexts in which people act that are the priority (Beck, 2002:39-40).

With different nuances and emphases, most critical social theory is drawn from this perspective. For Bruno Latour, there is no such thing as Nature in itself and by itself or anything like Society (or Culture). The difficulty of analysing environmental phenomena such as drought proceeds from its simultaneously multidimensional character, “at once real, like Nature, narrated like discourse, and collective, like society” (Latour, 1993:6). The set of realities (both human and nonhuman) that populate the world is formed by hybrids of Nature and Culture that multiply endlessly. Realities such as, greenhouse gases, ‘Dolly’ the cloned sheep, the hydraulic press, a bottle of milk, water supply systems or air conditioning in a shopping mall, are realities simultaneously social/cultural and physical/natural and “their coherence, i.e.: their relative spatial and temporal sustainability, is predicated on networks assembled from human and non-human relationships” (Swyngedouw, 1999:4 and 2011:44).

Richard Levins and Richard Lewontin, for their part, detest simplistic, reductionist, teleological, and homogenizing visions of Nature. There is no single Nature, there is no transcendent natural state of things that is trans-historical and/or trans-geographical; on the contrary, there is a range of different historical Natures, relations and natural environments that are subject to continuous change and transformation –occasionally dramatic or catastrophic– that are seldom preventable in their entirety. For these authors, there can be no universal or

fundamental affirmation about what is Nature, or what it should be or where it should be directed. For Stephen Gould, too, there is no security whatsoever in Nature, which is unpredictable, erratic, and moves blindly and spasmodically. “Without equivocating, to reduce (or not, as the case may be) carbon dioxide emission affects the world’s climate and forms various sorts of socio-environmental patterns (which, of course, merit scientific study as well as ethical consideration), but this process –even if successful– will not by itself produce a ‘good’ society in a ‘good’ environment. (Swyngedouw, 2011:46). The natures really existing, are always complex and chaotic, often unpredictable, radically contingent, historically and geographically variable, risky and configured in ways infinitely entangled. “In other words, there is no Nature out there that needs or requires salvation in Nature’s own name or a generic humanity. Nothing is foundational in Nature that it requires, needs or demands to be sustained” (Swyngedouw, 2011:49).

The call to abandon the Nature does not intend, however, to suggest that we should ignore, let alone forget, the Reality of the natures or, more precisely, the socio-ecological relations of various sorts: multiple, capricious, and often unpredictable - of which we are part (Swyngedouw, 2011:61). Although nature does not exist beyond the metonymic chains that provide it with a certain meaning, there is of course a range of environments, of links in socio-natural relations. Environments come as a result of specific historical and socio-physical processes. All socio-spatial processes, in fact, are invariably constructed on the basis of circulation, metabolism and coding of social, cultural, physical, chemical or biological processes, but the outcome is often unpredictable, risky, and greatly variable. The metabolic processes of change are never socially or ecologically neutral. Socio-environmental ordering means that conflicts will arise, which are fundamentally political, and must be addressed in political terms. The question is to reveal who are the winners and losers, those who benefit and those who suffer –and in what way– in the particular processes of metabolic circulation (Swyngedouw, 2011:62).

The uneven spatial distribution of the impacts of social metabolism

The increase in *inequality* –social inequality and spatial inequality– continues to be one of the most important aspects of the debate. “Never has the world been so unequal and never has wealth been concentrated at levels of such obscene proportions as now”, (Nogué and Romero, 2006:20). Or, as Ricardo Méndez says, “two decades of globalization have reinforced existing inequalities by

concentrating wealth and power in a few regions, businesses and social groups, while many others face exclusion or low participation in the profits” (Méndez, 2008:256).

The concentration of wealth and power determine the processes that relate to the material basis of the production system. As Michael Zürn says, between environmental collapse destruction as a result of wealth, and environmental destruction as a result of poverty, there exists an essential difference. While the environmental threats caused by the wealth are derived from the *outsourcing of production costs*, in the case of ecological destruction caused by poverty it is the poor who are destroying themselves with side effects for the rich: “the environmental destruction caused by wealth is distributed equally throughout the world, while the environmental destruction caused by poverty hits in specific locations and only becomes international in the form of side effects that are manifested in the medium term (Michel Zürn, 1995, cit. in Beck, 2002 (1999): 54-55).

For a long time now, there has been questioning of Kuznets’ hypothesis of an environmental curse, which explores the relationship between economic growth and environmental quality.¹ Simon Kuznets attempted to show that while short-term economic growth generates environmental degradation, environmental quality improves with the increase in income over the long term. Works such as those by Oscar Carpintero (2005) show that the “dematerialization” of the economy is not taking place: while there is a tendency for the first phases of extraction and refining to move beyond the borders of the most developed countries, joined with an improved efficiency of partial processes found there, and thus diminishing their Direct Material Input (DMI), the reality is that most of them continue increasing their Total Material Demand per capita² With this displacement, the local natural environments of wealthy countries may be improved, but at a cost of greater deterioration for the global natural environment, which is used as a source of raw materials but also as a dumping ground (Naredo and Valero, 1999:22). The negative ‘externalities’ of development are transferred from these places to the rest of the

planet. This phenomenon is directly tied to the “profound asymmetry that exists between monetary evaluation and physical costs throughout the economic process in general, which leads to inequality in the physical costs that underlies the monetary equality of exchanges in world trade itself”(idem: 41).³

Beyond this fundamental debate, a basic feature of the global economy is the uneven distribution of the use of materials and energy, whose transport has increased over time. During the early stages of industrial development, the exploitation of the principal minerals used was carried out basically in the industrialized countries: the main producers of iron and coal were the main users of the same. Even with regard to mineral deposits that are poorly distributed in the world, such as bauxite and oil, imports did not exceed 25% of the needs of rich countries. However, as of the mid-twentieth century, the consumption of coal and oil in these countries increased by factors of five and ten, respectively, resulting in an increased mismatch between requirements and availability in their territories. The same happened with most minerals, so that these countries generally became net importers. To the countries that are traditionally receivers of resources, i.e. Europe, USA and Japan –the Triad Power, as defined by Kenichi Ohmae (Méndez 2008:225)– the transport of oil now adds the “dragons” of Southeast Asia. Their emergence in the economy has meant the introduction of energy-intensive industries and pollution, which has become the third largest net oil-receiving area on a global scale (Naredo and Valero, 1999; Naredo, 2010:57-59).

Despite the higher growth rates in the latest stage in the East, Southeast Asia and some Latin American countries, the countries of the Triad still concentrated in 2001, 64.8% of the value, measured in dollars, of the exports and 68.4% of imports of goods, reaching 71.4% and 68% for services. It should be noted the rapid growth in the relative weight of countries in Southeast Asia and China, which exceeded in 2001 the export of US goods in this year: 13.9% and 12.2% respectively, when these figures were 3.9 % and 17.0% in 1963 (Méndez 2008:228).

But to understand the reality of trade generated by the global economy, it is necessary to supplement the data expressed in monetary aggregates with data expressed in physical quantities. Therefore, a quarter of 6,092 million tonnes that were transported by international trade in 2000 remained in wealthy countries (mainly: fossil fuels, others arising from mining activities and to a much lesser

1. Kuznets formulated his famous curve in the fifties to relate the distribution of income with the income level and only more recently other authors used his curve to relate environmental degradation to the level of income. Therefore there is rigorous attributed to having designed their own Kuznets curve with the modern desire to relate income and environment (personal communication from Jose Manuel Naredo, see also Naredo, 2010:42-43, footnote 14)
2. Direct Material Input (DMI) or Direct Material Requirement refer to materials having an economic value that are used in production and consumption activities. Hidden Material Flows are the materials extracted and moved that are not adequate for being introduced into production and consumption activities and that are never a part of economic valuation. The Total Material Requirement is the sum of the Direct Material Flows and Hidden Material Flows, both domestic and imported

3. See footnote 4 on the reductionism reigning in the attribution of values on the part of conventional economics, that imposes a growing asymmetry between monetary value and the physical and human costs of processes

extent, agro-forestry and fishery products). This group of countries by itself is a net exporter of manufactured goods, producing a tonnage much less than it imports in raw materials. The Direct Material Requirement (DRM) average in the world was in that year seven tonnes per capita; while in Japan it amounted to 17,20 in USA, 22 in Germany, and 38 in the Netherlands. While the Total Material Requirement (TMR) surpasses 18 tonnes per capita for a world average, it is 46, 84, 86 and 84, respectively, in the aforementioned countries. This huge net inflow eventually becomes waste that is only subject to marginal recovery or recycling, causing the accumulation of waste is the first issue of "environmental policy" in these countries. Ironically, the debate does not focus primarily on the cause (the management of massive resources brought from around the world and the impact on the countries of origin), but their effects (waste and damage caused in host countries) (Naredo, 2010:59-63).

This is the dynamic that results in the current concept of *environmental debt*, which the People's Agreement, approved in Cochabamba (Bolivia) in April 2010, refers to the liability incurred by the industrialized countries of the North, its institutions, the economic elite and their corporations for the gradual appropriation and control of natural resources and the destruction of the planet caused by their patterns of consumption and production. "Based on this definition, people of the South feel themselves to be the creditors of this debt, which is based on the current model of industrial production, waste production, the emission of greenhouse gases, capitalism and free markets."⁴ Although still afflicted with scant power and little chance of legal recognition, the concept of environmental or ecological debt –which includes issues such as trade that is economically and ecologically uneven, generation of environmental liabilities, bio-piracy and climate change– is a useful interdisciplinary tool for denouncing the ecological and social unsustainability of the current global economic system and to question the legitimacy of foreign debt (Villalba, 2008).

A particularly problematic aspect of this general phenomenon is the management of hazardous waste that has been on the international environmental agenda from the early 1980, giving rise to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted in 1989 in response to an outcry after the discovery in Africa and other parts of the South of toxic waste imported from the central countries.

4. People's Agreement of Cochabamba, World People's Conference on Climate Change and the Rights of Mother Earth, 22 April 2010, Cochabamba, Bolivia. (<http://www.deudaecologica.org/Que-es-Deuda-Ecologica>)

Throughout this period, the most significant areas of conflict that have been identified are: exports in violation of the Basel Convention, claims made by transit countries of transit and import for not having been served notice or having not consented; difficulty of controlling the entry and exit of waste; lack of clear definitions (what is waste, what is a transit country, what does it mean to be safe). Since the signing of the convention, the controversy over the free export of waste has resurfaced several times, including summits at Rio (1992) and Johannesburg (2002), leading to calls for the cessation of these activities (UNEP, 2011). Despite these advances, the increasing pressure from rich countries to get rid themselves of waste cheaply and effectively has led to consider depositing them in the great depths of the seas, as an ideal landfill that accords with the prevailing logic of not requiring economic agents to take responsibility for recycling, or at least neutralize, on-site, the waste they generate.

In short, there are profound differences between the model of colonial domination of a century ago and today. In the previous model, the metropolitan states held sway installing colonial administrations in other territories, to extract from them certain primary products, sell other manufactured and profit by colonial trade were reinvested, in part, and especially in the form of infrastructure (ports, railways,...) aimed at expanding trade. There was usually a flow of population from the metropolis to the territories to colonize. In this model, waste and damage just transcended the local level which generated. There are currently rich countries whose privileged position continues basically being supported by trade. However, in other countries with financial systems more capable, this model has evolved into one in which financial hegemony is imposed on trade, supported by a powerful military that remains a key factor.⁵

In this model of globalization, greatly expands the purchasing power of the world by the rich and, therefore, the net flow of energy and materials received from the rest of the world which helps ensure the quality of their local environment. But the globalization of the mining and resource trade also bring global expansion of the waste, unlike the previous model, it transcends the local level. This leads to a globalization of withdrawals and impacts destructive and polluting of the human species on the planet (with climate change as its highest expression),

5. "The United States maintains a globe-spanning network of over 750 military bases [...] This enormous military machine requires a vast supply system originating with American weapons manufactures that in turn depend on a prodigious and ever-expanding torrent of funds from the U.S Treasury [...] The United States currently engages in "special operations" in 120 countries, using elite commando units skilled in assassination, counterterrorist raids, foreign troop training and intelligence gathering" (Heinberg 2012, 1-2)

which runs parallel to the economic-financial economic globalizations and military that underpin and promote (Naredo, 2010:106-110).

The debate on *de-growth*

In this socio-natural and discursive context, in recent years, first in France and Italy then, with other terminologies, in the English-speaking world (Global Economic Transitions Movement) and the Global South, the term *de-growth* (*decrecimiento*, *décroissance*, *decrecita*) is challenging the debate. It serves to draw attention to the consequences of the logic of economic growth that ignore the nature of the production in which growth itself is based, and the absurdity of maintaining strictly monetary indicators as the criterion for evaluating economic processes.

A key reference point is that, after 20 years of experience, one cannot continue to rely on the strategy of efficiency and *dematerialization of the economy* (i.e., *decoupling* the use of materials and energy for growth). The persistence of the “rebound effect” (Jevons paradox or effect) has become indisputable fact: it has been consistently confirmed that, as part of an expanding economy, the savings due to efficiency is systematically redeployed to new consumption of the physical resources. For example, the case of water: the huge efficiency gains (declines of between 15% and 25% of allocations in most Spanish cities between 1991 and 2011) have not reduced the pressure on aquatic ecosystems. Experience has shown repeatedly that, in addition to efficiency, limiting and reducing the scale of physical production are necessary conditions for progress towards reducing the consumption of materials and energy (Schneider, Kallis and Martínez-Alier, 2010: 512 and 517).

The theoreticians of *de-growth* distinguish between *depression* (an unplanned *de-growth*, accompanied by deterioration of social conditions, as part of a growth regime) and *sustainable de-growth*, which is a voluntary, gradual and equitable transition towards an equitable system of lower production and consumption. Proposals by Serge Latouche (*Le pari de décroissance*, 2006), which are disseminated and debated in Spain by Francisco Fernández Buey, Joaquim Sempere, Carlos Taibo, Joan Martínez-Alier and others, suggest the need to build livelihoods based on social relationships, closeness, austerity, community life, and a slower pace. These dimensions, these authors argue, far from being limiting, are life-enhancing, as has been made manifest by studies on *subjective well-being* (such as those by Clive Hamilton, 2005) that conclude that, after a certain level of income,

increased well-being comes with a parallel increase in workload, while providing minimal gains in objective well-being. Hamilton's works are recent contributions that continue the research on the “Easterlin paradox”, which in 1974 had revealed (though the debate on the methodology used is not yet over) the lack of correlation between happiness and GDP, once a certain level of needs is met.

Undoubtedly we are dealing with approaches (with deep roots in the history of thought) that point to the cornerstone of the debate on sustainability: the need for a profound cultural change, a change of values, goals and “sensitivities”, in the sense in which Edgar Morin expresses it when he says: “when a system is incapable of solving vital problems by itself, it is thus degraded, it disintegrates, unless it is able to cause a *meta-system* capable of doing so and, then, it metamorphoses(...) Although it seems possible to correct certain evils, it is impossible to stem the technical-scientific-economic-civilising tidal wave that leads to planetary disaster. Yet human history has often changed course. Everything begins always with an innovation, a new break-through message, marginal, modest, often invisible to its contemporaries(...) There must be promoted, in a *de-globalising* fashion, the empowerment of the local, local artisans, local businesses, peri-urban orchards, local and regional communities...” (Morin, 2010 and 2011:31).

It is worth emphasising the reference to techno-science, since the criticism of it is a central aspect of the new set of ideas: research and technological innovations in the process of metamorphosis that Morin advocates should involve contributions to reduce consumption rather than feeding a spiral of innovations aimed at increasing it exponentially. This topic is of great importance. Since *technological optimism* is a key to productivist and neoliberal arguments in the debate on the future of the “environmental crisis”, the criticisms of techno-scientific system itself as a factor of the problem itself are essential. The of Jared Diamond is also significant: “All of our current problems are unintended negative consequences of technology at our disposal. Rapid advances in technology throughout the twentieth century have created new and difficult problems at a rate much higher than that which solved the former ones. That is why we are in the situation where we are in.” (Diamond, 2007:653).

In line with these ideas, the decrease paradigmatic proposition of *de-growth* is that human progress is possible without economic growth. *Sustainable de-growth* would involve a reduction of gross domestic product (GDP) as measured today, due to reduced activities of production and consumption of resources on a large and intense scale. Sustainable *de-growth* would not mean, however,

an equal and general de-growth: some small to medium scale economic activities (renewable energy, public transport, and housing rehabilitation) and impoverished regions and social sectors would have to grow selectively. To the contrary, growth of a business, sector, country or region that outsources its costs to other areas would not be acceptable. In this sense, a line of criticism of the movement insists de-growth the obviousness of their approaches and the error of taking up again a debate (the inadequacy of GDP as an indicator of social welfare) that has clearly been resolved. But while the maturing of the criticism of conventional indicators of development is a fact (today it is no longer surprising to an audience of middling culture that forest fires or traffic accidents increase the GDP), the reality is that the presence of GDP in the political-social-media debate today has not only has not decreased, it has increased: today the public anxiously awaits information on variations of tenths of a percent in the growth (or decline) of GDP, which will signal the end or continuation of the recession.

In any case, the representatives of the de-growth are not focused, in general, on the reduction of in GDP by itself as an objective, but in redefining social and individual well-being. They quote, for example, Georgescu-Roegen's idea of "the joy of living", which takes us back to the deep (ancient) roots of the new current: an emphasis on *relational goods*, those in which the relationship itself is the value of the good, that arise from interpersonal relationships and from encounters in which are essential both identity and intentions of the parties involved (Schneider, Kallis and Martínez- Alier, 2010).

In this sense, there are notable connections between the *de-growth and feminist thinking, even though they do not coincide entirely (Moral Espín and Coronado, 2010). Both stress the centrality of the idea of well-being and quality of life, unrelated to commercial consumption, income, wages and employment. They question the validity of conventional economic indicators ("source of deep deception") for not including environmental costs and resource depletion, and also because they do not to account for household and volunteer work. Both question the centrality of markets and underscore the dangers of a mass merchandising activities; they call into question the centrality of employment, and demand a reduction in working hours and the possibility of developing different jobs and activities throughout workers' life cycle if desired and according to personal circumstances. They speak of the need to develop "time policies": time for personal development, time for participation, time for care-giving, time for the development of arts and crafts and games, time for contemplation or simply to enjoy life. Both emphasise relationships and the importance of emotions*

in human society: the "sustainability of life" (Carrasco, 2001). Or, as Ivan Illich says, 'conviviality', given that the industrial society has advanced a new professional elite, whose work consist in convincing us that "we need what we need", while to oppose them we can use (again in the words of Illich) "the tools of conviviality" (Illich, 1978).

Criticism of de-growth proposals

This current of thought has been severely criticized along theoretical and policy grounds by authors who, in some cases, are very close to their proposals. In this regard, José Manuel Naredo said that environmental degradation and social polarization occur also in situations of stagnation or de-growth of monetary aggregates constituted in GDP and other indicators. Consequently, the important question is not questioning the formal growth rates of these aggregates, but the underlying rules for evaluation. "One would have to correct the rules of the economic game (reforming the *Regla del Notario*⁶ –Notary's Rule– and establish institutional frameworks that promote equality, solidarity, cooperation...) in order to change its orientation and re-direct processes towards environmental and social horizons that are healthier than those used currently" (Naredo, 2011:32-33). Naredo recalls that already in 1987, he himself noted that the stagnation or decline of monetary aggregates tends to moderate, but not prevent, the deterioration of the natural environment caused by the economic process. Any rate of growth of monetary aggregates can be compatible with the application of diverse technologies and impacts on the environment and people's lives, so one cannot speak of zero growth or de-growth as a solution to the environmental crisis, without specifying its connection to the physical, biological and even utilitarian world. "Only the conversion of the economic process can avoid it, to the extent that it –following the example of biosphere– supports their physical flows in renewable and closing material cycles obtained from the Earth's crust, converting waste in renewable resources or making it inert, and then reinserting them without damage to the environment" (Naredo 1987, 3rd ed. 2003:365).

Naredo denies that Nicholas Georgescu-Roegen may be considered a precursor of de-growth. It was Jacques

6. The concept of the *Regla del Notario* (Notary's Rule) refers to the reductionism reigning in the attribution of values on the part of conventional economics, which imposes a growing asymmetry between monetary value and the physical and human costs of processes, that is, the higher physical cost and drudgery, less monetary valuation. This rising asymmetry surreptitiously transfers the values of preceding hierarchies to the current commercial and democratic societies. José Manuel Naredo has provided a mathematical, quantified and accurate analysis of how this pattern operates in actual processes (Naredo and Valero, 1999; Naredo, 2010)

Grinevald, says Naredo, who began using the word in the title of his book *Demain la décroissance*, in which were translated and disseminated into French some of the works of Georgescu-Roegen. Moreover, none of the original texts by this author, coming before or after the book by Grinevald was introduced, used in its title the word de-growth nor did any defend of 'de-growth' as a proposal. It is 'conversion', not de-growth, that is proposed by Georgescu-Roegen, although he considers unrealistic the possibility of eradicating or completely reversing the entropic character of the economic process and the predatory and consumerist identity of human beings (Naredo, 2011:30).

When Herman Daly came out in favour of zero growth (the predecessor of the current concept of de-growth) after the first appearance of the Club of Rome report *The Limits to Growth* (1971), Georgescu-Roegen vehemently criticised the proposal of "steady state" formulated by Daly (Naredo, 2011:29). This proposal, Naredo says, "went unnoticed into history as a fad, as surely as de-growth will." Which does not mean to continue drawing down resources silently nor fleecing in a headlong rush, in one way or another, the planet's resources and environment, that will not change until we change the usual economic rules that drive this mechanism. The conversion of the system that Naredo advocates would internalise the use of certain renewable energy sources and reduce the usage of other pollution-causing limited resources, paired with the greater use, re-use and recycling of some materials and the reduction of the use of others "which is incompatible with the proposal of de-growth as a general goal" (Naredo, 2011: 30-31).

Actually, knowing the materials written by the authors who are identified with de-growth, one cannot avoid the feeling that these criticisms are rather unnecessary, to the extent that, as shown in the previous section, they are assumed by these authors. Herman Daly himself noted many years ago that one of the "less clever" arguments against steady state economy (SSE) was introduced by the editors of *Fortune* magazine in 1976, who indicated that the country had already gone through a real period of zero growth (1973-1975), a period remembered as the worst recession since the 1930's. *Fortune*, said Daly, identified SSE with the failure of the economics of growth, but a situation of non-growth can occur in two ways: as the failure of the economics of growth, or as the success of the steady-state economy. Both cases are "as different as night and day," Daly says; no one denies that the inability to grow on the part of the growth economy causes unemployment and suffering. It is precisely to avoid the suffering from the collapse of economic growth (because we know that growth cannot continue) that SSE should

be advocated. With a celebrated and, in my opinion, unfortunate image, Daly points out that an airplane will crash into the ground if it tries to stay stationary in space since they are designed for continuous movement, but that is not the case of helicopters (Daly, 1977).

The weakness of the image is that Daly suggests that the problem has a technical solution (what is the difference between airplanes and helicopters?), in this case with material and energy costs per weight unit shifted even higher. As Ted Trainer says, some advocates of de-growth (and this would to some extent apply to Daly) do not fully understand the implications of a steady state economy: they act as if it could or should eliminate the element of growth, while leaving the rest more or less unchanged. This strategy is not realistic because the real economy is an economy that "has growth" is a "growth economy", a system in which most of the structures and core processes involve growth. If you remove the growth would have to find radically different ways of carrying out many processes. De-growth thinkers act as if growth were the only thing, the primary thing or enough to be solved, but the underlying problems cannot be solved unless it is to radically reconfigure certain systems and structures of capitalist consumer society (Trainer, 2011). Trainer's reflection aimed at the heart of the debate: the intrinsic necessity of constant growth and accumulation by the capitalist system, which requires some form of this permanent flight forward.

The difficulty of the alternatives

Riechmann begins by discussing the difficulties of the process of transition by noting that developments are produced in the factors that, while necessary, do not challenge the very "rules of game" for the system. This is the case of advances in efficiency, which as has been found in previous processes of "environmental modernization" does not preclude, as a result of so-called "rebound effect", that pressures and impacts continue to grow. The processes are more efficient but the volume of production is growing faster than the percentage of reduction of required resources. Progress was also made in the idea of "bio-mimicry" (mimic and learn from nature), consisting in encouraging patterns of action to minimize alterations of functional natural cycles in the resolution of needs (Prats, 2009:13).

However, the principles of caution and *self-restraint*, those affecting the basic mechanisms, fundamentally involve changes in social, cultural and institutional strategies. These are more alien and opposed to the dynamics of the workings of the economic system, and very little

progress has been made in them. There are very strong socio-cultural elements, such as the culture of going ever further, and the limitlessness of human desires, the undefined improvement in the human conditions that is identified with increased consumption of goods and services (Reichmann, 2007). As Nicholas Georgescu-Roegen wrote, "... the person who thinks he can design a plan for the ecological salvation of mankind does not understand the nature of evolution, that is the history of permanent struggle between ever new forms, and not that of a predictable and controllable physical-chemical process like cooking an egg or sending a rocket to the Moon "(quoted by Riechmann, 2007 and Naredo, 2011).

The truth is that to meet the demands of expected population growth and "take the developing world out of poverty," without jeopardizing current living standards of the more developed countries, would require a huge increase in energy resources. And the scenario of a "sustainable growth of energy resources" is very uncertain. Moreover, the complex and nonlinear nature of the global economy raises the possibility of energy shortages triggering enormous socio-economic disturbances (Brown et al., 2011).

The key question is how many of the values can be retained of the consumers living in the First World. The current political impossibility of proposing to citizens of the First World to reduce their pressure on the planet is quite clear. But "the alternative of continuing to maintain their current impact is even more impracticable" (Diamond, 2007: 679). That's the major problem: many preferences that in rich countries are already satisfied by the system for a wide swath of society cannot be claimed as rights because they cannot be made universal. This means that "the transformation of socio-economic system involves reductions in levels of security and well-being that for the most part are considered indispensable achievements of society" (Martínez and Galante, 2011:59). Everything seems to point to this problematic conclusion, with which Antonio Estevan finished his latest reflection on wealth and power: "Environmental damage cannot be stopped without limiting quantitative growth in the overdeveloped countries. This thesis, which is nothing new, remains unquestionable, beyond the propaganda of development in which institutions remain bemired "(Estevan, 2007:20).

Conclusions

We are witnessing, indisputably, a process of profound environmental decay, which is combined with the beginning of a social and economic crisis that may be long in duration and come to an uncertain end. Step by step, predictions are being confirmed about the

direction of global dynamics that began to take shape in the 1970's. Since then, they have been partially masked by three decades of cheap fossil fuels and that, coupled with errors and exaggerations, has covered up disqualifications little nuanced of these predictions. The reality is that, with regard to critical thinking, despite how contradictory the essentialist-realist and constructivist methods and assumptions may be, both are agreed on the diagnosis of the situation at hand: the risk society and the global crisis. For one, it is the hazards (scenarios of total disaster) of the global risk society which constitute the main focus, while for the other, it is the opportunities and the contexts in which actors behave.

The energy crisis, climate change and global ecological deterioration are closely linked. The major global institutions of power, though not all, speak of one of these axes, climate change and its consequences, but almost completely ignored so far the more imminent global energy crisis and ecological decline, which are also underway. It is noteworthy to observe this tendency when, for modern global capitalism, the decline in energy supplies is bigger problem in the short term than climate change, whose consequences remain limited despite their seriousness, given that they do not affect the internal dynamics of expansion and concentration of capital even while they will in the medium and long term.

Although the technological optimism remains the core of neo-liberal thinking, the scientific-technical consortium is increasingly seen more clearly as an essential part of the problem, not the solution. As Horacio Capel said: "Surely we do not need more scientific studies, although all of them may be useful. What is needed is a new attitude that recognizes that scientific knowledge simply not enough. That is to say: a shift from geography, ecology and economics to political geography, political ecology and political economy, to name just a few branches of knowledge. Or better yet, just politics. "(Capel, 2003).

The central issue, not yet addressed politically and explicitly, is that the ecological decay cannot be stopped without limiting quantitative growth on the part of the underdeveloped countries; this means reductions in levels of security and welfare that are widely regarded indispensable social achievements, in societies that, although overdeveloped, are deeply and increasingly unequal. The most urgent need, to which it is critical for geographical thinking to contribute, is to shed light on who will lead, who will rule (besides the elites, the real powers and their political representatives who already rule), the current process of actual de-growth that has already started and will not end in a return to conditions of ten years ago in a stable manner. Who is to control

spatial distribution and timing of the process, and who will decide and in favour of whom will be decided the kind of Nature we want and are able to inhabit.

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