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## **<CH>Environmental Crisis? Do We Know What We Are Talking About?**

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It was Ernest Gellner who coined the expression ‘modular man’ to define the fragmented state of the human condition in the different waves of modernity that we are submerged in. Each of us passes through different experiences, simultaneously carrying out different roles, not always carrying a logic or a unifying and coherent force.<sup>1</sup>

Contrary to what used to happen with the predictable inhabitants of pre-modern societies, or what continues to happen with those members of contemporary society marked by the homogeneity of historically buried fundamentalisms aggressively returned to the centre stage of history, we citizens of democratic societies from the West will not be fooled by clothing or eating habits. We are the holders of an enigma of our pluralism, prisoners of the capacity to carry out multiple functional roles or to articulate the most disconcerting of language games. From reflection on the exterior of our partial gestures and behaviours, no one can deduce or guess what we are as a whole. There may even be the suspicion that this whole is improbable, or a mere work in progress.

I would like to extend the 'modularity' hypothesis to the area of the environmental crisis, which since 2006 and 2007 has returned to the centre of worldwide political and media rhetoric, especially through the growing concerns regarding the evidence of climate change, and converging in the fragile consensus apparent among political, economic and social players concerning the severity of what is at risk in this process, as well as the urgency to make a response on the same scale as the threat. The Copenhagen Conference in December 2009 failed, despite previous hopes that, contrary to what happens so often, in this case of environmental and climate crises, the alerts and cautions of the scientific community would not fall onto the sterile soil of inertia among those in command but rather would become fertile humus that would feed the coming together of the international community in a common approach against the ontological danger that characterises this century. Is that what it is all about? Do we all mean the same thing when we talk about 'environmental crisis'? Or is it that, stuck in the functional dilacerations of our 'modularity', made up of disparate values, perspectives and interests, we reflect the environmental crisis as the light of the thousand sparks of a broken mirror, incapable of producing or sharing a common representation of this global threat?

### **<A>1. Ambiguities in the 'Crisis' Concept**

Words serve to differentiate mundane things and acts, to steer thought in the task of illuminating the paths where the action is projected and prolonged. When we talk about the environmental crisis, we run the risk of not adequately performing this task of identification of differences.

The crisis concept has been suffering, both in day-to-day language and academic discourse, a levelling process of losing the capacity to be a significant semantic vector. The word has suffered from overuse, being used to designate critical situations that go from mental health to the functioning of capital markets. It has become a buzzword, dominated by ambiguity.

There are two semantic segments contained in the origin of the word 'crisis', based on ancient Greek, that have been confused to the extent that a significant tension has been lost, which would result from their active maintenance and coexistence, as follows: the difference between *the act of judging* (such as a doctor's diagnosis or a judge's sentence) and *the act of deciding*, which brings us to the urgent need to overcome in word and deed the difficulties encountered in a path that has lost its way. It is in the poem by Parmenides (fragment 8.15) that these two primordial dimensions clearly emerge, with equal weight on both, judgement and decision.

In everyday language, the word 'crisis' has often been left in the narrow sphere of *judgement*. The crucial domain of *decision* has been forgotten, or, at least, put in a secondary position, being perceived more as something that results from the crisis and not as an intrinsic demand in comprehending it. And there's a world of difference between thinking of the decision as part of something, or as situated externally to it.

The semantic integrity of the crisis concept, in its original meaning, is of huge importance if we want to establish a sufficient understanding of what is going on at a global level with the state of the environment (and not just the climate, that is certainly an essential configuration of the planetary ecosystem, globally considered). To call the situation a crisis will not be sufficient without

understanding that the diagnosis of the environmental situation cannot be separated from adequate and timely decisions, that is to say, from all the necessary measures to face the threatening aspects identified in the diagnostic. These measures include political laws and strategies, research, scientific and technological innovation, financial investment and economic entrepreneurship; not to mention changes in individual behaviour and small-scale actions by individual citizens in their ethos as responsible consumers.

Sadly, academic discourse has also contributed to weakening the alert function contained in the concept behind the word crisis, thus weakening its role of anticipation of threats and dangers. Throughout the best of our intellectual tradition there has been a certain amount of appeasability, which varies between tragic pathos and epic exaltation, with the role of demiurge of the new and even of the alleged agent of progress, carried out by the crisis in modernity. The philosopher Hegel condenses this idea well when he proffers the famous declaration: 'Universal history is not the basis of happiness. In its happy periods are blank pages.'<sup>2</sup> How can we proclaim alerts or mobilise responses if crisis seems to be the driving force of historic destiny, of all that must be registered in the pungent chronicles of historic memory?

## **<A>2. Between Crisis and Collapse**

Periods of crisis are, really, exceptional moments in the history of peoples and individuals. They test creative capacities, the resistance and resilience of social groups, institutions and people. Based on our own experience, each of us can understand the truth in the aforementioned statement by Hegel. Nevertheless, 'overcoming' (*Aufhebung*) the more negative aspects of any crisis should not

lead us to the extreme position of making banal the suffering, pain and destruction normally associated with it. The colossal injustices, loss of lives and dilapidation of the wealth achieved through human work, that are committed in wars, revolutions or in the technological metamorphosis of the economic systems – critical moments par excellence – cannot be annulled and forgotten due to the positive result that the future may find in the final balance of these transformations. Contrary to the very disseminated court of history, what we can expect from it is not a sentence that forgives debts and absolves guilt, but the difficult and pitiful conservation of the empirical data, the chronicle of events, the most rigorous articulation of the facts, so that these may survive the successive waves of interpretation that each generation develops about the past, making it their own past, controlling it through hermeneutics that are always in a (re-)elaboration phase.

The idea that there's a limit beyond which the productivity of the crisis becomes materially impossible and morally unacceptable has been lost in the greater intellectual tendencies of modernity. Optimism, especially technological or techno-centred optimism, has taken on a leading role in relation to other readings, both from the past and in relation to the task of evaluating the possibilities contained in the future. Optimism has become a kind of a priori of the transcendental grid of the reading of history. This optimism brings together the most disparate schools of thought: from the postmodern heralds of the twenty-first century to the followers of Marx's history philosophy, for whom 'humanity only gives itself tasks that it is in a condition to resolve'.<sup>3</sup>

A similar attitude, often associated in the practical sphere with technophiles of the technological fix, often naive, that there will always be a

technical device to solve any problem, no matter how gigantic it is, contributed greatly to the processes of organised blindness that permitted the accumulation (almost lost in space and time) of the factors and indicators of the environmental crisis we now find ourselves in. It's not surprising, therefore, that it was about the environment that reflections from different sciences and schools of thought arose in search for a vision capable of returning to the concept of crisis its original sense of alert and urgency.

In 1949, Bertrand Russell posed a critical question: can our scientific society stabilise and survive its own expansion dynamics? The answer would depend on our ability to accommodate the disruptive dynamics caused by three critical factors of systemic impact: excessive demographic growth, risk of nuclear war and environmental aggression. For Russell, the cataclysmic hole left by the negative impact of economic growth on the ecosystems was evident: 'Both industry and agriculture, to a continually increasing degree, are carried on in ways that waste the world's capital of natural resources.'<sup>4</sup>

But how can we name a crisis that runs the risk of not revealing the most heroic fibre of individuals' and the institutions' capacity to perform well, but instead leading us to a desert of ruins, to the most abandoned silence that Earth has ever heard since it has been inhabited by men and women? What name do we give to an environmental crisis that appears to be more critical than any of the others that preceded it or that accompany it?

A good contribution to an answer to this essential question was given by the Canadian, Thomas Homer-Dixon when he baptised our times as being characterised by an 'ingenuity gap'. Contrary to displaying the typical optimism of technophiles, Homer-Dixon advises us to look with prudence at our

contemporary challenges, so great and complex are they. We're dealing with a kind of race against time, between threateningly real global problems (especially environmental ones) and their potential solutions, possible but still far from being effective. It's a race that has yet to be decided, but that, for the moment seems more inclined towards the side of the current tortuous problems than the solutions that the future may hold for them.<sup>5</sup>

How can we name a crisis without a visible solution, a crisis that can dive into itself, into an implosion process with unexpected characteristics and consequences? There's no doubt that we can only answer this question with another concept, 'collapse'. Jared Diamond and other authors have quite rightly tried to draw attention to the special nature of an environmental crisis. A crisis that becomes a collapse cannot be absorbed by any 'optimistic' logic. The collapsed civilisations so attentively studied by Diamond on a global level and with a historic amplitude that is often millennial, end up in ruins in silence. They are the victory of evil and of nothing over all the justifications and theodicy.<sup>6</sup>

At its most radical limit, the global environmental crisis that we all talk about could run the risk of being just the start of a global process that could drag human civilisation as a whole, for the first time in history, into an ontological abyss. A crisis that would really be the antechamber of the collapse. If the situation is so serious, how is it possible that we have not understood enough about it, generating the scientific and political consensus necessary to move to decisive action and the measures to avoid the rupture? How is it possible that the most advanced technological and scientific society that the planet has ever known runs the risk of arriving too late at the uncertain crossroads between a way of *crisis* and another way – that leads to *collapse*?

### <A>3. Is the Environmental Crisis a Proper Object of Scientific Enquiry?

Twentieth-century mass popular culture (the equivalent to, in a gross analogy, 'popular philosophy', eighteenth-century Prussian *Populärphilosophie*), which continues to impact, at least partially, throughout our twenty-first century, dominated a conception of science characterised by mixing elements of, on the one hand, positivist self-confidence ('only science has the conditions to produce real knowledge'), and on the other hand, our most ingenuous hopes ('science is the most noble and disinterested human activity, spontaneously aiming at humanity's well-being'). A similar model of popular belief and science, combining in the same crucible the search for truth and philanthropy, could only have been predicted as the main protection for us humans against all types of current or potential danger, and therefore as being the main candidate not just for the identification of the global environmental crisis but also the timely presentation of the most efficient measures to combat it efficiently, that is to say, in a preventive way.

But the difference between the ideal world of convictions, that are part of the mythology of our mass media societies, and reality couldn't be more different. If we consider the process of forming constitutive problems of what we could today call the *constellation of the environmental crisis*, what can be said, at least, is that as we do it we will be in a position to elaborate a type of gallery of heroes and heroines.

They are solitary voices, that, in most cases, encountered strong hostility or inhospitable indifference from their peers. Right from the start, Robert Malthus, father of the demographic alarm, saw his name transformed into an



insult; Svante Arrhenius on climate change; Aldo Leopold on environmental ethics issues; Rachel Carson on the omnipresent chemical contamination of the food chain; Jacques-Yves Cousteau on the destruction of marine ecosystems; Kenneth Boulding on ecological economy; Hannah Arendt on the metaphysics of difficult times; to name but a few such pioneers.

The heroes and heroines in any area of human activity exist to be praised. Their sacrifice signals trails yet to be explored and their courage serves to feed the belief in us that maybe the existence of humanity has not been in vain. Nevertheless, scientific heroism as a solitary experience is almost a contradiction in terms. What differentiates the pre-modern 'friend of knowledge' from the modern 'scientist' is the fact that the latter is part of one or various groups of researchers. For us, science is a precise institutional and methodological process, with standards and routines, a process with public spaces for constant dialogue and critical observation, comprising universities, institutes, academies, research centres, laboratories, scientific journals, conferences and seminars. It was Francis Bacon who first identified the idea of a scientific community – with an area for research but also for the presentation and validation of data and respective results – as being inseparable from the actual existence of science as an institution that would change humanity's direction forever.

It is extraordinary to affirm the asymmetry between what is monstrously and frighteningly at stake with the possibility of environmental collapse and the relative paucity of what has been effectively done by the scientific community to confront it. Let me take just two examples, in order not to shock you. First, although we have had literature on climate change, since at least the first essay

written on the theme by Svante Arrhenius in 1896, the truth is that it was not until 1988 that the Intergovernmental Panel for Climate Change (IPCC) was established and only in the past three decades did significant investment in more profound studies and research on the climate begin. Secondly, despite the degree of general public awareness and the scientific information available on the great problems of the environmental constellation, from climate to biodiversity, from the oceans to the scarcity of fresh water or energy, the truth is that if we compare what societies invest in the study and protection of the environment with what is invested in military defence and in business as usual, it is impossible not to be stunned by the huge advantage of the latter.

It would be absurd and even counterproductive not to consider the environmental crisis as an object of scientific activity. It's important also to recognise that it only acquired this status late and with difficulty. And this fact, this late and unwilling integration of the environmental crisis into the objects of the *episteme*, was not due to any negligence, omission or forgetfulness, but rather it is inscribed in the matrix of modern science itself. Modern science was not born to cause social alarm, as Descartes stated, it was born to greatly increase material comforts and the healthy duration of human existence. Or, as Francis Bacon wrote, for 'the enlarging of the bounds of Human Empire, to the effecting of all things possible.'<sup>7</sup> Modern science appeared to bring us good news, to be transformed into the armed conqueror of utopia, bringing it from the future to the present, from heaven to earth, to make hedonism not a school of moral thought but a normal experience for the citizens of modern technoscientific societies. The environmental crisis, to the contrary, talks of alarm and not of hope. It incites us to moderation and prudence, not to conquest and the

glory that accompanies it. That's why it has arrived late as an object of study, due to the difficulty in entering in its own right into the modern city of science.

#### **<A>4. The Environmental Crisis in the Network of the Complexities of Scientific Endeavour**

The only statement that can be made with absolute certainty regarding the integration of the environmental crisis into the scientific arena is that each step will be subject to powerful resistance, regardless of the area of the environmental constellation or the specialities that will be recruited for research. What we do know upfront is that if science takes on a critical attitude, then sounding alerts concerning established orders and regimes (be they legal or economic) will provoke a violent reaction, a disproportionate one, due to the conflict of interests. Two different examples from the past illustrate this statement. First, the aggressive campaign against Rachel Carson, promoted and financed by the chemical industry, irritated by the cry of alert against pesticides contained in the seminal work, *Silent Spring*. Secondly, the extremely strong attacks by the tobacco industry over decades against the public health professionals who denounced the lethal dangers involved in smoking tobacco, not just for active smokers but also for passive ones. Who is surprised that nowadays, even when the proofs and facts of climate change are clear and well-known, voices are raised proffering gross attacks against climate research and the scientists who most stand out due to their advice for prudence in public policy?

Nevertheless, it would be simplifying things to consider that the difficulties arising regarding scientific research on the environment come from

outside science. In order to better understand the reasons that condition, limit and even prevent timely widespread consensus regarding important environmental issues, we would have to understand the web of complexities that, within the practice of science itself, ends up creating a considerable degree of opacity and entropy for progress in research and how this conveniently articulates with political orientations that should embrace the best scientific recommendations possible.

In my opinion, the following are the main complexities and obstacles:

#### *<B>4.1 Epistemological Complexity*

Science is in general a difficult activity. It demands long academic preparation and uninterrupted training throughout one's life. Taking into account the personal sacrifices and the degree of dedication and discipline that this job demands, it is no accident that doing science is said to be not just a profession, but also rooted in a vocation. Most of the major environmental issues are by nature interdisciplinary, they demand combined effort from different areas of knowledge. The construction of heuristic approaches to establishing the collection of environmental data, as well as its analysis and interpretation, constitutes a huge epistemological challenge, especially if we consider the vertical structure of the different areas and the actual orientation of universities towards specialisation, at least at a graduate level and for those immediately above. Project leaders, faced with the difficulties raised by the epistemological complexity of environmental issues will hesitate between going ahead or carrying out a more comfortable project within their speciality.

#### *<B>4.2 Organisational Complexity*

To a much greater extent than was anticipated by Francis Bacon in the seventeenth century, a scientific project is nowadays a true company. Knowledge, methodological discipline and, if possible, a stroke of genius on the part of the researchers involved, is no longer enough. Company management skills are indispensable if projects wish to obtain financial resources in order to be able to properly fulfil their ambition. With the environment, and especially when we are dealing with global environmental problems, as is the case with climate change, this organisational complexity increases tremendously. In order to be able to feed, for example, the IPCC, working as a global network, multiple skills need to be combined, that vary from accessing public and private funds – always scarce in more competitive areas – to the ability to be able to communicate to the public, not forgetting the urgent need to maintain constant supervision over the methodology that allows for quality control of the scientific contents themselves, so that mutual trust between researchers from various different areas will assure that there are no doubts regarding the credibility and reliability of the published results.

#### *<B>4.3. Complexity of Paradigms*

The environmental crisis has been kept in the shade for decades, not because the symptoms were not visible in the real physical world but because the dominant points of view from the different areas of science kept them relatively invisible. It's all about the general functioning of scientific paradigms, so well explained by Thomas Kuhn in his classic work of 1962. The main obstacle to consensus in environmental sciences resides in the fact that the diagnosis of the environmental crisis questions the basic foundations of the dominant

paradigms, and therefore the psychologically comfortable ones, foundations that, although they are based on belief and conviction, work as rules – although they don't have the same degree of legitimacy.<sup>8</sup> In fact, the basic axioms of a paradigm can be read, simultaneously, as windows and walls, as angles of vision but also as factors of opacity. To a great extent, some of the contemporary debates on the most critical areas of the global crisis cut through that, as participants know where the windows are and where they became walls preventing the penetration of light from the objective outside world.

#### *4.4. Complexity of Expectations*

Modern science was born under the sign of a demand for more power for humanity. The sought-after truth would not be a disinterested truth but a really useful one. As Descartes wrote in the *Discourse on the Method*, we should become 'masters and owners of Nature'. Scientific discourse and research, especially with the advent of the rapid secularisation of western societies and with the entry into a phase of decline of the great religious narratives, transformed themselves, for some time, into the only activity with some ability to produce credible discourses. It's not surprising that almost all the ideologies of the twentieth century, from bolshevism to racism, looked for a scientific basis for their delirious visions of the future. The advent of the environmental crisis, as a scientific theme, was to radically contradict this 'civil religion' vocation that science had achieved and sought to preserve. The experience of the environmental crisis, with its courting of technological catastrophes, identifies and underlines the contemporary rupture in the expectations of a technical euphoria bordering on magic. The sciences of the environmental crisis raise

their voices, precisely during a phase when science itself is in a process of decline from its secular pedestal, and starting to be discussed in public places as if it were just one of many various opinions. This change, while it is not exempt from positive possibilities, contains the risk of ruining science's credibility, and of degrading its role in the contribution to public policy development and the production of confidence and social cohesion itself.<sup>9</sup>

### **<A>5. Is a 'Back to Earth' Science Possible?**

No one today is in a position to be able to respond with rigour, to the fundamental ontological question of our time, which consists in knowing if our civilisation will be capable of evolving positively, facing the lethal challenges of the global environmental crisis, or, to the contrary, will become slow and hesitant, stuck in our inertia and conflicts, incapable of building working consensus, leaving us teetering above the abyss of collapse. What we can safely say now is that for the first possibility to succeed we will have to count on an even more intense involvement of science and the scientific community in all of its dimensions, in the construction of the conditions that will allow us to traverse the dangerous era of transition we have already embarked on.

In my opinion, there are two essential conditions that must be fulfilled should science want to play this decisive role in the risky, current transition of civilisation. The first condition has been well summarised by Bob Doppelt when he alerted us to the urgent task of rearranging the relationship between knowledge and subjects, so as to be ready for climate change.<sup>10</sup> Doppelt's appeal deals with the new responsibilities of social sciences, including, obviously, economics and sociology among others. Continuing to insist on the

treatment of climate change, as the most visible part of the environmental crisis, merely under the scope of physical and natural sciences, would be a big mistake, would end up paralysing us in adequate and timely inspirational public policy planning. Much of the reverberating criticism of the IPCC raised by the media, especially in generalist media, derives from this lack of understanding of the need to widen the understanding of the environmental and climatic theme, leaving the shores of obsolete conceptions of certainty that make us run the risk of not seeing the difference between prediction and projection or between fact and trend, dragging science to a level of distrust, uselessness and paralysis.

The second condition is even more demanding and radical. Hannah Arendt best clarifies it in a 1963 text dedicated to the consequences, for our anthropologic identity, of the 'conquest of space'.<sup>11</sup> For most of us nowadays, when we look to the future and see increasingly thick and dominating clouds, it would seem prudent to drum into science's attitudes an aggressive and profound 'return to Earth'. After centuries of successive Copernican revolutions, of distancing, decentring and indifference in relation to our planet and the future of our species, what we need today is a kind of neo-Ptolomaic turnaround of knowledge, not in the sense of its substance (which would be absurd), but in terms of form. That is, it's about placing science at the service of human interest, which implies a combination of the two tasks. First, the intransigent defence of the Earth as a place where humans can live in dignified conditions. Secondly, the recognition of human fragility and mortality as inherent to our ability to give direction and meaning to an existence that can and deserves to be lived.



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<sup>1</sup> Ernest Gellner, *Conditions of Liberty: Civil Society and its Rivals* (London: Alan Lane, 1994), p. 97ff.

<sup>2</sup> ‘Die Weltgeschichte ist nicht der Boden des Glücks. Die Perioden des Glücks sind leere Blätter in ihr’, in G.W.F. Hegel, *Vorlesungen Über die Philosophie der Geschichte, Werke* (Frankfurt am Main: Suhrkamp, 1986), vol.12, p. 42.

<sup>3</sup> ‘...stellt sich die Menschheit nur Aufgaben, die sie lösen kann.’ Karl Marx, ‘Vorwort Zur Kritik der politischen Ökonomie [1859]’, in Günter Heyden und Anatoli Jegorow (eds), *Marx–Engels Gesamtausgabe*, (Berlin: Dietz Verlag, 1980), vol. 2.2, p. 101. See also my text: ‘O Desafio da Pós-Humanidade’, in *Metamorfoses. Entre o Colapso e o Desenvolvimento Sustentável* (Mem Martins: Publicações Europa-América, 2005), p. 183ff.

<sup>4</sup> Bertrand Russell, ‘Can a Scientific Society be Stable?’, *British Medical Journal*, 10 December 1949, p. 1307.

<sup>5</sup> Thomas Homer-Dixon, ‘We are indeed in a race between hard imaginative thinking – or what I call ingenuity – and the ever expanding complications of our world. And in too many critical places, and on too many critical issues we’re losing the race.’ Thomas Homer-Dixon, ‘Ingenuity Theory: Can Humankind Create a Sustainable Civilization?’ 2003. See <http://www.homerdixon.com/ingenuitygap/home.html>.

<sup>6</sup> Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Penguin, 2004).

<sup>7</sup> Francis Bacon, *New Atlantis and The Great Instauration*, ed. Jerry Weinberger (Arlington Heights, IL: Harlan Davidson, 1989), p. 71.

<sup>8</sup> ‘Rules, I suggest, derive from paradigms, but paradigms can guide research even in the absence of rules.’ Thomas S. Kuhn, *The Structure of Scientific Revolutions* [1962], in, *International Encyclopaedia of Unified Science* (Chicago: University of Chicago Press), vol.2.2, p. 42.

<sup>9</sup> The problem communication in science is one of the fundamental themes of the theory of ‘post-normal science’ developed by Jerome Ravetz and Sílvio Funtowicz. See, e.g., J. Ravetz, ‘When Communication Fails: A Study of Failures of Global Systems’, in Ângela G. Pereira, Sofia G. Vaz and Sylvia Tognetti, (eds), *Interfaces Between Science and Society* (Sheffield, Greenleaf, 2006), pp. 16–34.

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<sup>10</sup> 'One of the problems is that the issue is still being framed as a scientific and environmental issue. This is a major mistake. Climate change is just a symptom of dysfunctional social and economic practices and policies. It is a social and economic issue. The emphasis needs to shift away from the biophysical sciences now to the social sciences if we have any hope of solving this problem.' Bob Doppelt, *Guardian*, 14 April 2009.

<sup>11</sup> 'It would be geocentric [the new science] in the sense that the earth, and not the universe, is the centre and the home of mortal men, and it would be anthropomorphic in the sense that man would count his own factual mortality among the elementary conditions under which his scientific efforts at all.' Hannah Arendt, 'The Conquest of Space and the Stature of Man' [1963], in *Between Past and Future: Eight Exercises in Political Thought* (New York, Penguin, 1993), pp.265–80.