The planetary ecological crisis or an education for the civilizacing re-evolution?

The human species is facing a dead-end road. The industrial civilization has already started to clash against the limits of the biosphere. Changing a world without fossil fuels will be a whole historical revolution and the growing threat of breakdown of the ecological balance points to one scene, the global warming, that endangers the survival of the human species. We face a crisis of civilization that demands a radical change, especially in education.

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We are not human beings with spiritual experience. We are spiritual beings with human experience.
Pierre Teilhard de Chardin

When an individual form of life, or a specie, faces a radical crisis, when the old way of existing in the world, interacting with others and the nature does not work anymore, when survival is put at risk by a crisis that seem to be unbeatable, or dies, vanishes, or raises up from the limitations of its condition through an evolutionary leap, in that moment, a re-evolution starts.

PRELIMINARY ISSUES: GLOBAL CHANGE, EVOLUTIONARY LEAP AND TRANSFORMATION OF THE CONSCIENCE

It seems unlikely that a species exposed to a strange and foreign environment experiences an evolutionary

transformation, unless it is forced to do so due to any extreme vulnerability. Heidegger said, citing Hölderlin, that "where danger threatens, salvation also grows" (Heidegger 2000: 9).

Undoubtedly, mankind faces nowadays a "global change" as a result of the convergent crises that endanger its survival in the Earth Tierra; that is the magnitude of the threat that the civilizing project is facing. But the global crisis of the biosphere is the consequence of the crisis of mankind, a result of the malfunction of the human mind clung to the ego, which was comprehended more than 2500 years ago by the ancient cultures and that is been overwhelmed by technology produced by the "objective science" (or normal science).

Until recently, the transformation of the human mind was nothing but a possibility, acknowledged by a few individuals here and there, regardless of their cultural or religious contexts. The human conscience was not flourishing because it was not necessary, but now mankind is experiencing the progressive decomposition of the old mental patterns of the ego and the appearance of a new dimension of conscience facing a conclusive dilemma: re-evolve or collapse.

This is a new paradigm. And the new paradigms are almost always welcomed with hostility, even with mockeries and indifference. Their visions may seem heretical; so is the case of Copernicus, Galileo, Pasteur, Mesmer, Hawking, among others. In the decade of 1960, Erich Fromm noticed that any radical idea would be able to survive unless that it was represented by people whose lives were the key of the message in itself (Fromm 1970). The transformed self is the mean and the transformed life, the message.

The human life and collective human conscience make up an inextricable unit with all the other forms of life in the Earth. Now, a transformed state of the human conscience starts to arise, while the old conscience disappears, which reflects in a physical level through consecutive extreme climatic events that occur simultaneously in different regions of the world and that trigger in turn other anthropic disasters.

In this context, this article proposes a comprehension of the "planetary ecological crisis", starting from the complex perceptions[1] of the ancient wisdom inherited by the Andean civilization; with the intention of creating, among the globalizing dynamics, an own narrative[2] that contributes with statements for a "civilizing change" facing the multiple and systemic crisis and that, at the same time, contributes to the construction of a local society, but also a universal one, heading towards the unitas multiplex, that is, towards to the unity based in human diversity (Morin 2003).

This implies, from the transcomplex epistemiology[3], to recognize the pertinence of the principle of universality, but assuming its deficit and linking it additionally to the local and singular. Because to the extent that our culture approaches the knowledge of foreign and ancient cultures, the huamn spirit will have more possibilities of developing its autonomy (Morin 2002: 138).

PLANETARY ECOLOGIC CRISIS AND THE DIALOG OF KNOWLEDGE: THE "OWN STORY" OF THE ANDES

The crisis of the civilizing project is the crisis of the "world-system" that, in one hand, reveals itself in the international financial seism, and, in the other hand, evidences itself in in the translimitation of the biosphere, which has grown to the level of "planetary emergency". Both processes —certainly dramatic— shape the "global change".

In its physical dimension, the global change shows itself in the alteration of the natural cycles of the matter (carbon, oxigen, nitrogen, phosphorus, sulfur, water) and energy; a highly complex phenomenon, characterized by accelerated and convergent dynamics that feedback and redimension from the non-linear effects of the population growth at a primatological scale, the desertification, the loss of stocks of biodiversity (agrobiodiversity) and the climate change.

1 The ecologist approach of Gibson defends the theory that the perception (or sensitive experience) is a simple process; the information is in the stimulus, without the necessity of subsequent internal mental processes. This approach starts from the assumption that in the laws of the nature underlying in each organism are the intellectual keys of perception as mechanism of survival; therefore, the organism just perceives what it can learn and what is necessary to survive (Gibson 1979).

2 A "narrative", according to MacIntyre (1977: 453), is a rational story rebuilt in the search of the truth.

3 The transcomplexity is based in the investigative complementarity and the transdisciplinarity.

All of these is related to what is happening in the human conscience.

With respect to the cognitive dimension of the man, the biospheric crisis of the Earth is the expression of the collapse of a model of thinking and knowledge construction, which constitutes the basis of the "global society". In this light, a reflection made by Albert Einstein shakes the confort zone in which we thought we were safe as a specie: "We need new ways of thinking to face the problems generated by the old ways oh thinking".[4]

Nowadays, the global scientific community —in its majority, and in an unprecedented move— recognizes that the climate change is a planetary problem, and that its solution could mean the biggest collective challenge of mankind[5]; therefore, it is essential to assume the magnitude of the phenomenon, not only for anticipating its trends or effects, but specially, for identifying and questioning the underlying causes of the global ecological crisis.

The comprehension of climate change implies approaching to the phenomena that mainstream traditional disciplinary boundaries, ranging from geosciences to climatic anthropology. Global climate disruption pushes for opening an interdisciplinary and transdisciplinary vision but also, multidimensional, as it requires the incorporationof alternative solutions to the subject, the collective, the local territory and the planet.

As Herman E. Daly (2007) noted, the increased attention that the climate disorder attracts nowadays is laudable, being the predictions of the complex climate models the more used in order to address its impacts. However, it is pertinent to recall the observation of physicist John Wheeler: "We built the world by the questions we ask." Then we formulate some questions: What kind of world do these climate models build? Do they recognize other possible worlds facing the global change? Is the global change a consequence of an epistemic crisis of modernity?

Given these questions, the "dialogue of knowledge" emerges as a statement of otherness (I-You / You-Us Relationships) to rethink the disciplinary rigidities that dominate science in general and climate science in particular; but also to draw out the strengths and resiliencies occurring in regions such as the South American Andes, even when they are not "officially" incorporated into public policies for climate management. Being this part of the world a zone of high bioculturality (Tropical Andes hotspot[6], center of genetic diversity, water sources[7], high cultural diversity), such a situation should not be considered a minor issue, but a key aspect to reassess and strengthen "other-worlds that still happen".

The South American Andes civilizations are facing -in their local territories- threats and impacts of anthropogenic climate change, but are themselves highly resilient again. Over 10 thousand years of civilizational construction, knowledge and technologies have been developed for water domestication, breeding of agricultural biodiversity and agro-astronomical observation through a closer look at the movements of the Sun, the Moon, the "dark" constellations (interstellar gas and dust) and "stellar" constellations (the qollqa[8] or the Pleiades, the chakata or Andean cross), thus providing preventive information on the dynamics of weather and climate. Sophisticated systems of ancestral knowledge to manage mountain ecosystems –based in the cyberspace principle of "massive parallelism[9]" - are part of such existing strategies of socio-ecological resilience, and its maintenance is essential to disperse the risk of aggressive variability

4 The Word "crisis" comes from Greek, in which we find the same term (κρίσις), with the meaning of separation, distinction, election, judgment, dispute, decision, sense, resolution, sentence. At first, such Word does not have a negative connotation; its etimologic root means at least the contrary to accepting an inevitable destiny. The crisis is a time when the routine no longer serves as a guide and we need to choose a path and give up on another. Crisis is the time for decision and intelligent change. For example, in Chinese the word crisis has a double meaning: "danger" and "opportunity". The natural state of the world is dynamic, the change which varies its rhythm from multiple fluctuations and regulations that have a high component of chaos. Crisis is the natural state of things.

5 See Global Warming: Confronting the Realities of Climate Change. The Union of Concerned Scientists. [Online]. <http://www.ucsusa. org/global_warming/>.

6 Latin America has a very high biodiversity in both species and genetic variation as well as in ecosystems. It is estimated that over 40% of plant and animal species on the planet are found in these ecosystems (see PNUMA 2000).

7 Although Latin America has only 15% of the surface and 8.4% of the world population, it receives 29% of the precipitation and represents a third of the world's renewable water resources (FAOSTAT 2002).

8 Quechua word which translates to Spanish as warehouse, storehouse or barn.

9 In the Andes, the management of climate risk follows cyber laws; such is the case of the Ashby Law: "Only the variety of responses of a system controls the variety of states of the physical environment."

ecoclimate ; in an environment where the only constant is uncertainty and constant change.

This is all possible because from the comprehension of the complexity and the practice of deep ecology[10], present in the centrality of the defining features of the Andean worldview[11], it is assumed that "all beings who inhabit the cosmos are living beings, they have soul, being nature the center of life regeneration"; all these beings can "talk to" with respect and affection, about the passing of time[12]. So are gathered again the Earth, mankind and the cosmos, remodeling themselves into a whole that becomes sacred space. As Mircea Eliade (1981: 9) states: "[...] the sacred always manifests itself as a reality in a totally different from the 'natural reality' order '.

It should be precised, in a very superficial way, that complexity is what is woven together, so intertwined together, which can not be divided and yet can not be separated, so a paradox of the of the one and the multiple is set. More deeply, Edgar Morin defines complexity as "[...] the fabric of events, actions, interactions, feedbacks, determinations and hazards that constitute our phenomenal world" (1994: 31)[13].

The "animism" of the Andean culture is therefore the comprehensive account of the complex, while it assumes life as an "emergency"[14], that is, as an expression of "the whole is greater than the sum of its parts". To this friendly and "sacred" view of life on Earth James Lovelock approach with his "Gaia hypothesis" and the ecologist Stephan Harding, director of the Master course on Holistic Science at Schumacher College, with his book Animate Earth: Science, intuition and Gaia (Animated Earth: Science, intuition and Gaia) (2009), which seeks to recover a respectful relationship with the planet, as a body full of life and purpose (Abram 1997).

From that perspective, it is therefore essential to internalize the ancient wisdom —as another episteme— involves thinking, feeling, intuition and sensory perception as equally valid ways of access to knowledge, even when conventional scientific experience objects everything related to feeling and intuit[15].

Animism is often considered archaic and backward, then unable to create comparable scientific knowledge. So the "normal science" (or cosmology of domination) has tried to replace this older worldview; and "validate" knowledge, innovations, practices and traditional technologies through protocols for systematization and integration into the gnosis of technoscience. However, ancestral knowledge (still in force) take significance within the culture that sustains it.

Indeed, it is still attempted to ignore systematically the importance of traditional knowledge systems towards the need to build (or visualize)[16] other alternative solutions to the global ecological crisis, ignoring the fact that this crisis highlights a eroded and exhausted thinking model that, being at the base of the civilizational project exposes it to the collapse. Vandana Shiva (1993) has suggested the term "monocultures of the mind" to describe the totalitarian and exclusive features of Western knowledge, its authoritary implementation and undemocracy epistemically.

Today, mankind subsists amid tensions that converge in two levels: biosphere and technosphere, while the latter linear processes collide violently with the

10 From deep ecology, the fundamental interdependence of all phenomena is recognized and, as individuals and as societies, we are all immersed in (and ultimately depend on) the cyclical processes of nature. (Capra 2000).

11 According to the Center of Native Cultures Kawsay "[...] the worldview is the human development that recovers the ways of seeing, feeling and perceiving the whole reality, that is humans, nature and cosmos. All cultures of the world have their particular worldview. Therefore ours, located in this part of the planet, and in this continent, also have theirs"(2005: 14). Ulrich Köhler said that the worldview of a population "[...] synthesizes in a structured manner the principal concepts about the shape and quality of the Universe, its inhabitants, and man's place within this system" (Köhler 1980: 583).

12 The Andean time is not linear, irreversible or segmented; the happening of events does not cancel the others.

13 Complexity is a category to rethink our human condition, which presupposes a new relationship with knowledge, a reform of thinking, education and politics as well.

14 An "emergency" is a quality that comes, putting it into functionalist terms, of the sum of the parts, but can neither be reduced to the parties, nor be restricted or explained from any of them. For further reading, see Pajares (2012).

15 Traditional knowledge cannot be considered as a mere phenomenon located. Such knowledge extends across cultures, histories and geographical areas, as well as over time (translation Erick Pajares G) (see Sefa 2002:4).

16 The invisibility of the 'other' is expressed at first in the "invention" of the New World, typical of a Renaissance European imaginatry, which ignores the specificity of American reality and the Third World, and thus establishes his disappearance, denial and concealment (see Quijano 2002).

cyclical processes of the biosphere. The interaction between social and natural perspective has led to a model of social organization —the sociosphera— reflecting a deep crisis. This situation explains why it is not sustainable that economic policies replace climate policies[17], and why it is essential to rethink a civilization that has given him his chances of survival to technoscience and transhumanism (Velázquez 2009: 577-590) which postulates that the human species is able to overcome his intellectual and physical limitations through technological control of their own biological evolution. The reinvention of society will imply then to move towards the definition of "public policies of/for social economical systems" recognizing that "[...] [t]he constructed society, like all complex organizations, is vulnerable to decay and destruction, due to the laws of thermodynamics environment "(Martinez 2014).

The crisis of self-organization of the planet is pushing to achieve a full discussion of critical thinking[18] and a responsible attitude to the need to "deconstruct" the knowledge that has brought us to our survival as a species unfeasible on Earth, with inexorable move towards forms different thinking, recognizing the existence of other epistemes and other gnosis. The urgence to reshape the way people experience the world demands a redefinition of the meaning of being of the human species as a collective project, and in turn implies the reinvention of current global knowledge policies, to make way for others that emerge from dialogue of knowledge among the best "objective science" and "ancestral knowledge systems". We need to rethink reality as a complex whole, that is, as a whole which is woven in common: everything is interconnected, everything is interdependent.

As things stand, we must learn to differentiate and distinguish; however, that does not mean separating. From that perspective, the dialogue of knowledge implies acknowledging the existence of diverse knowledge, and gives the scientific episteme the opportunity to connect with other forms of thought processes, to succeed in reharmonizing and reconnecting what was off balance and divided in the first modernity: the relationship between science and social practices, the interdependence between mankind and nature.

This way, the dialogue of knowledge evolves into an ontological position based on respect and horizontal relationships, equivalent and democratic, acknowledging ''the other-different one" as a responsible individual and actor of his own destiny, and seeing humans as unaccomplished beings, who are able to reinvent themselves as they are in contact with others and the world.

However, at the same time we proceed with the dialogue of knowledge, surpassing the discipline and reaching a transdisciplinary thought will be pivotal. Michel Foucault argued extensively about the power of disciplinary knowledge. It may often become difficult to be accepted by "experts" in one or another discipline when attempting to connect with it and failing to proceed according to it. Such relation of knowledge-power-discipline continues to impede what cannot be postponed: the convergence of knowledge to reinvent ourselves as a species, facing the global biospheric crisis.

On a global scale, climate change is an identical phenomenon which has similar impacts in various regions of the Earth, such as sea-level rise, deglaciation, drastic changes in the precipitation pattern (floods and droughts), biodiversity loss or soil erosion; however, it has been culturally interpreted —on a symbolic level— in very different ways: there is only one Earth, but various climatic cultural worlds occur simultaneously. As stated by Clark A. Miller:

> "[…] local knowledge has become more than just the basis for competition or knowledge affirmation; now it is also an instrument for participating in global politics. Insisting on getting room for local knowledge becomes an advanced work oriented toward valuing the practices and ways to understand nature and society, which differ from the ones introduced by the "forces of globalization" (Miller 2004: 85).

The United Nations Framework Convention on Climate Change (UNFCCC), in Article 3.°, principle 1, men-

17 Concern about climate change is anthropocentric; that is, there is interest in controlling their perverse effects especially for mankind. From biocentric perspectives (the Gaia theory, for example) climate change would not be a problem, because even in very different biophysical conditions, the Earth would remain.

18 Critical thinking can look to the past or the future, but never is conjugated in the present tense. It lies in a horizon of past when it puts into question the legitimacy of the establishment. It is planned looking forward to the future when it proposes new ways of approaching reality. According to Linda Elder and Richard Paul, creators of the Foundation for Critical Thinking, this thought "[...] implies a commitment to overcome selfishness and natural sociocentrism of human beings" (Editorial Norma 2008: 4).

tions the common but differentiated responsibilities of the Parties, facing the global phenomenon; and, additionally, principle 3 mentions that "the policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party […]"[19].

Accordingly, climate governance needs not be based on the greater or lesser responsibility of the UNFCCC Parties regarding the emissions of greenhouse gases (GHG), but needs to take into consideration the different forms in which the human societies perceive, understand and relate to the climate, which is of greatest importance for a region with an unparalleled bio-cultural heritage —just like the South American Andes.

CLIMATE CHANGE, CULTURAL CODES AND EDUCATION FOR COMPLEXITY

The First World Climate Conference, organized by the World Meteorological Organization (WMO), was held in 1979. Therefore, the trends and the scale of nonlinear effects of climate change have been known for more than three decades. It is, thus, evident that neither the scientific evidence, though plentiful, nor the supply of technology for climate protection, have enabled to transform public policies and the behavior of citizens; while indifference and negligence have surpassed the public awareness and ethical questions regarding the causes of the world's environmental crisis.

The cultural codes of societies —in both industrialized and developing, poor countries— resist changes in the consumption model of fossil fuel and matter that should have been produced some time ago facing the destruction of Earth's ecosystems. Such behaviors demand attention and in-depth analyses, where it is indispensable to reach a multidimensional approach to the global phenomenon, accepting it not only as a "scientific fact" but mainly as a "social fact."

Thereon, during the cycle "*Temas actuales de la sociedad mexicana*" (''Current issues of the Mexican society), conducted by *Instituto de Investigaciones Sociales* (IIS) (Institute of Social Research - IIS) of *Universidad Autónoma de México* (UNAM) (National Autonomous University of Mexico - UNAM), at the table "*Ciencia, sociedad y política del cambio climático*" (Science, society and climate change policy), Rafael Loyola Díaz, member of IIS-UNAM and director-general of *Centro del Cambio Global y la Sustentabilidad en el Sureste* (CCGSS) (Center for Global Change and Sustainability in the Southeast - CCGSS), pointed precisely that "[…] the climate change issue is, to a large extent, a social phenomenon of obvious anthropogenic origin, that requires modifying the civilizing model and its scale of values."[20]

In fact, on a pragmatic level, we can mention that the societies' behavioral and response patterns, as well as the relevant climate and environmental policies, are also immersed in both socioeconomic and political-cultural traditions and habits, that at a given moment may impede the necessary processes of international cooperation.

Even so, the sociocultural dimension of climate change is barely considered by the global cooperation networks, hence it is essential to move on into various policy understandings, in order to achieving the establishment of a global climate governance (climate governance) respecting the diverse governances arising in local territories, which are based on other cosmologies, worldviews and epistemes.

The global climate disturbance is not an issue only relevant to experts, because its consequences affect the whole of humankind. Facing such an enormous challenge implies a previous modification of the social behavior that caused it, as well as realizing that climate change does not mean the same for all societies or territories; such is the case of cultures that achieved a level of civilization —such as the Andean culture— which support a social institutionalism and traditional knowledge passed between generations (social software), and constitute the foundations of the adaptive management in the upper mountains of the South American Andes.

However, it will not be possible to achieve a change of paradigms to revert the planetary emergency without an education that contributes to the transformation of behavioral patterns and unsustainable

19 Adopted by the General Assembly of the United Nations Organization by means of resolution A/RES/48/189, dated December 21, 1993.

20 See *Para combatir el cambio climático es necesario modificar la organización social*. [Online]. Periodismo de Paz <http://ciudadania- express.com/quienes-somos/>.

lifestyles (Harrison and Huntington 2000), while at the same time promoting —from the notions of interculturality— dialogue among cultures, convergence of epistemes, willing of otherness, and reconnecting sensitivities to recover our various consciousness: anthropological consciousness, ecological consciousness, earth consciousness, cosmic consciousness (Morin 2002: 156).

Education does not occur by itself; instead, it takes place in a sociocultural context. Education can be regarded as an element of social and cultural reproduction, as a purveyor of the dominant culture, but also considered as factor of transformation of society (Sanmartí and Pujol 2002).

In that regard, it should be noted that Maturana and Varela —quoted by De la Torre and Moraes (2005)— mention that it is no longer acceptable for educators to ignore the educative implications of the epistemic conception that integrates the concepts of intersubjectivity, certain amount of organization, complexity, disarray, uncertainty, nonlinear dynamics characteristic of the living systems, because they are connected to the cognitive science and allow a more challenging vision of the morphogenesis of knowledge, a nonlinear dynamic vision of the reality that demonstrates the existing context between cognition and life (De la Torre 2005: 42).

Mankind is currently facing a situation of extreme urgency (Mayor Zaragoza 2009), which meets our social model as a risk society (Beck 1997) resulting from an utilitarian model regarding the relationship with nature. Consequently, as Francisco Varela pointed out, in the context of the multiple converging crises: "[…] the chance of surviving with dignity on this planet hinges on the acquisition of a new mind" (Varela 1995).

The critical environmental thought emerges from that perspective in order to reveal the contradictions of the economic system (the economy-world), promoting a critical reading of the environmental reality which enables explaining the implicit ethical and ideological components in the environmental crisis; establishing connections between environment and lifestyles; contributing to democratic political practices which allow the participation of citizens in public affairs regarding the solution to environmental problems.

In that sense, socially critical Environmental Education registers "environmental education in a process of critical analysis of the interrelated environmental, social and educative realities (carrier or reflection of ideologies), with the purpose of transforming them" (Sauvé 1999: 11).

There is no doubt the "metamorphosis of civilization" cannot be achieved solely through political technology (technopolitics)[21], but requires introducing policies to educate from and for complexity; as well as, the ability to promote an intercultural dialogue allowing the participation of individuals and communities, using their own worldviews (Pajares 2010). This dialogue among cultures is based on respect and mutual valuing (acknowledgement), the reduction of opportunity inequality (equity) and having a say in public areas (participation).

Therefore, taking into consideration the extent of this task for mankind, education for re- evolution must transcend the intercultural dialogue in order to reach the "dialogue of civilizations", which is essential for building mutual collective, cooperative, and supportive solutions to planetary problems. The transition toward obtaining our "planetary citizenship" involves a constant transformation process where each actor in a dialogue is not merely subject to transformation, but is also able to participate as an active transforming being[22]. Since, in the same way as Teilhard de Chardin affirmed: "Isolation is a dead end street… Nothing in this world could grow if it were not by convergence."

BY WAY OF INITIAL CONCLUSIONS: BIOSPHERIC CRISIS, EPISTEMIC RUPTURE AND THE EVOLUTION OF THOUGHT

Bearing in mind the converging crises the planet and the human societies are going through, we believe that an education aiming a civilizing re-evolution must consider the following statements:

21 Massive organizational capacity mediated by the network, it is a pattern of political self-organization in the network society. (Toret 2003).

22 The seminar "Dialogue of Civilizations" was held in Tehran (Iran), on December 13-14, 1998. The seminar counted on the contribution of 110 communications, with the participation of dignitaries from Germany, Italy, Egypt, Syria, Lebanon, Kenya, Japan, Canada, Malaysia and Russia. The central topics under discussion were: a) the definition of civilizations, b) the foundations for a dialogue between civilizations, c) religion, morals and spirituality, and d) peace and the future (see United Nations, A/54/290, September 1st, 1999).

Epistemological crises occur when thought patterns holding our own interpretation of the world are called into question, either because of our limitations or internal deficiencies, or because they have diminished in front of the perceptions and the understanding of other existing patterns. "Normal science" is currently going through a schism, since it cannot find solutions to the major planetary problems that it has caused itself, while global emergency suggests a critical debate regarding epistemic rupture, in order to demonstrate (or no longer deny) other ways of thinking and thought process. Modern science (classic scientific rationality) is known for impeding us from thinking in a complex manner, that is, globally, in a relational way; furthermore, we require a convergence of knowledge[23], the re-evolution of the human mind that will take us to another project of mankind, one which transcends the simplification/reduction paradigm in order to conquer the complexity paradigm (Pajares y Loret de Mola 2014).

The episteme of ancestral wisdoms is based on the principles of complexity, deep ecology and fractal logic[24], reconnecting, in an empathic manner, the Earth with mankind and the Cosmos. Thus, the narrative typical of the Andean worldview delivers fundamental elements to build a "civilizational change policy", through the dialogue of knowledge, a policy focused on explaining and combining the diverse ways of understanding the world. Such dialogue —suggested in terms of equivalence— must include an issue overlooked during the global climate debates: the ethics of the civilizing project.

In the face of global change, it is essential to suggest synergies, convergences and reinventions, accepting the "partial commensurability" existing among interpretative paradigms or different epistemes (objective science/traditional knowledge), and assuming climate change does not mean for some what it may mean for others. Global climate governance must be regarded as a governance network in which the cultures and their societies participate by expressing and experiencing their cosmologies and worldviews.

The ''noosphere", according to Vladimir Vernadsky, is an inevitable result of the biospheric crisis[25]. Global change is a biogeochemical crisis caused by the human mechanization of productivity and by the economical apparatus developed to facilitate the subsequent global industrialization. Vernadsky (1945) defined noospheric evolution as "[…] a qualitative pinnacle associated with humankind's mental development." From the biospheric transformation into a noosphere, it must be concluded that all of life tends towards consciousness and ever more evolved mental states[26], and that evolution is directed toward the refinement of human mental sensibility and consciousness.

The next geological age is the psychozoic era (or the spiritualization of matter), which is why the reinvention of mankind implies the conception of a paradigm that transcends the *homo economicus*. From that perspective, there is no doubt the foundations of the Andean worldview contribute to the biosphere-noosphere transition and to building a new Earth.

The global ecological crisis must be confronted with education for civilizing re-evolution. The aim is to achieve change in consciousness in a critical number of individuals (critical mass), to such an extent that accelerates the renovation of all society: to transform the world involves transforming human consciousness. A *vital education* must teach action-reflection-action; we must learn to reflect on action, in order to return to action; and to

23 In order to see further illustration on the transdisciplinary thought process, please see the Committee on Key Challenge Areas for Convergence and Health Board on Life Sciences (2014).

24 The Holographic principle establishes a relation between wholes and parts, system and components. According to Holographic principle, the whole consists of different parts, and at the same time the whole is in every part (read Morin 2001). The Holographic principle provides the concept of fractal scale, of inclusive and redundant nature, replacing the internal interactions of the system. It implies that each fluctuation gotten by the system unchains a range of processes that connect the diverse scales, incorporating transportation mechanisms and causal relations, of retroactive and recursive nature. In this way, a continuous relation is established between the system and its components, which determines a continuous flow and a lot of uncertainty regarding the ultimate knowledge of the dynamics of a system. This way, the aim of approaching a phenomenon of the world is to focus, without losing relation with the upper and bottom scales; to simplify, not isolate. According to Mandelbrot (1984), "[…] a fractal is a shape, somehow made of parts similar to the whole."

25 The noosphere is the mental sphere that we take for granted as a psychological environment common to all (planetary mind sphere, sphere of reason). This mental environment, unconsciously charged, is laden with assumptions, and, depending of the location where the individual is at, it can be full of flagrant contradictions.

26 To explore this issue further, see Vernadsky (1997).

approach the understanding of the complexity; to be able to practice overflowing the fractal scale[27], that is, such overflow might mean small to big steps and vice versa. Transformation, innovation, evolution and re-evolution are natural and necessary responses to any crisis.

Such overflow will be essential to transcend the endogamic debates about the global biospheric crisis, and for achieving shift in the dominant thoughts, for all we have known has almost completely failed us.

There exists an "ancestral mind" inherent to mankind; which is very old and is in everything, in everyone, in all. Our mission is to go back to the origin, the source, to conspire[28] the re-evolution that reincorporates humankind with Earth and the Cosmos, through a "another human mind"… This is because, as T. Elliot said, "in the beginning is the end."

27 By overflow, we mean exceeding what was originally envisioned (rupture).

28 To conspire, literally means "to breathe together". It involves a deep connection.

BIBLIOGRAPHY

ABRAM, David (1997). The Spell of the Sensuous: Perception and Language in a More-Than-Human World. Nueva York: Vintage Books.

BECK, Ulrich (1997). La sociedad del riesgo: Hacia una nueva modernidad. Barcelona: Paidós.

CAPRA, Fritjof12 (2000). La trama de la vida, una nueva perspectiva de los sistemas vivos. Barcelona: Editorial Anagrama.

CENTRO DE CULTURAS ORIGINARIAS KAWSAY (2005). Metodología propia, educación diferente. Cochabamba: Kipus.

COMMITTEE ON KEY CHALLENGE AREAS FOR CONVERGENCE AND HEALTH BOARD ON LIFE SCIENCES (2014). Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond. Washington, D. C.: National Academy Press.

DALY, Herman (2007). "Cambio climático: ¿Cuál es la pregunta?". La Diaria. Montevideo, October, 24.

EDITORIAL NORMA (2008). "Aprender a pensar". El Educador, Year 4, Number 16. Lima: Editorial Norma.

ELIADE, Mircea (1981). Lo sagrado y lo profano. 4° edition. Barcelona: Guadarrama / Punto Omega.

FAOSTAT (2002). Database: Farming, Use of the sole. Roma: FAO.

FROMM, Erich (1970). The Revolution of Hope: Toward a Humanized Technology. México, D. F.: Fondo de Cultura Económica.

GIBSON, James Jerom (1979). The Ecological Approach to Visual Perception. Boston: Houghton Mifflin.

HARDING, Stephan (2009). Animate Earth: Science, Intuition and Gaia. Totnes: Green Books.

HARRISON, Lawrence E. y Samuel P. HUNTINGTON (2000). Culture Matters: How Values Shape Human Progress. Nueva York: Basic Books.

HEIDEGGER, Martin (2000). "Die Fragenach der Technik". En Vortrage und Aufsätze [La pregunta por la técnica]. Conferencias y artículos. 9° edition. Stuttgart: Verlag Günther Neske.

KÖHLER, Ulrich (1980). "Cosmovisión indígena e interpretación europea en estudios mesoamericanistas". En La antropología americanista en la actualidad: Homenaje a Raphael Girard. Book I. México, D. F.: Mexicanos Unidos.

MACINTYRE, Alasdair (1977). "Epistemological Crises, Dramatic Nar- rative and the Philosophy of Science". The Monist, an International Quarterly Journal of General Philosophical Enquiry, Volume 60, Number 4. Nueva York: University at Buffalo.

MANDELBROT, Benoit B. (1984). The Fractal Geometry of Nature. Nueva York: Freeman.

MARTÍNEZ, Isidoro. (2014) Environmental Thermodynamics. [Online]. <http://goo.gl/NGtGB3>.

MAYOR ZARAGOZA, Federico (2009). "La problemática de la sostenibilidad en un mundo globalizado". Education Magazine, Special Issue: Educar para el desarrollo sostenible. Madrid: Minister of Educaction, Culturae y Sports, pp. 25-52.

MILLER, Clark A. "Resisting Empire: Globalism, Relocalization, and the Politics of Knowledge". En Sheyla JASANOFF y Marybeth LONG MARTELLO (editores). Earthly Politics, Local and Global in Environmental Governance. Massachusetts: Massachusetts Institute of Technology. Translation: Erick Pajares G.

MORIN, Edgar (1994). Introducción al pensamiento complejo. Barcelona: Gedisa.

MORIN, Edgar (2001). Tenir el cap clar. Barcelona: La Campana.

MORIN, Edgar (2002). Introducción a una política del hombre. Barcelona: Gedisa.

MORIN, Edgar (2003). Educar en la era planetaria. Barcelona: Gedisa.

PAJARES, Erick et al. (2010). Cambio climático y resiliencia en los Andes: Enunciar una política educativa para la complejidad. Lima: Foro Educativo.

PAJARES, Erick (2012). "Así en la Tierra como en el Cielo: Sabidurías ancestrales para re-crear los paisajes bioculturales y armonizar con el cambio climático en las montañas andinas". En Manuel GUZMÁN HENNESSEY (editor) (2012). Cambio climático, cambio civilizatorio: Aproximaciones teóricas. Bogotá: Universidad del Rosario y Klimaforum / KLN Network Latin America.

PAJARES, Erick y Carlos LORET DE MOLA (2014). "Otras políticas climáticas: Ruptura de episteme y diálogo de saberes". Perú hoy: Más a la derecha, Comandante. Lima: Desco.

PROGRAMA DE LAS NACIONES UNIDAS PARA EL MEDIO AMBIENTE – PNUMA (2000). GEO América Latina y el Caribe: Perspectivas del medio ambiente 2000. México, D. F.: Oficina Regional para América Latina y el Caribe.

QUIJANO VALENCIA, Oliver (2002). De sueño a pesadilla colectiva: Elementos para una crítica político-cultural del desarrollo. Popayán: Universidad del Cauca.

SANMARTÍ, Neus y Rosa María PUJOL (2002). "¿Qué comporta 'capacitar para la acción' en el marco de la escuela?". Investigación en la Escuela Number 46. Sevilla: Universidad de Sevilla, pp. 49-55.

SAUVÉ, Lucie (1999). "La Educación Ambiental entre la modernidad y la posmodernidad en busca de un marco de referencia educativo integrador". Tópicos en Educación Ambiental, volume 1, number 2. México, D. F.: Academia Nacional de Educación Ambiental, pp. 7-27.

SHIVA, Vandana (1993). The Monocultures of the Mind: Perspectives in Biodiversity. London: Zed Books.

SEFA DEI, George J. et al. (editores) (2002). Indigenous Knowledges in Global Contexts: Multiple Readings of Our World. Toronto: University of Toronto Press.

TORET, Javier (2003). Tecnopolítica: La potencia de las multitudes conectadas. El sistema red 15M, un nuevo paradigma de la política distribuida (IN3 Working Papers Series RR13-001). Barcelona: Universitat Oberta de Catalunya & Internet Interdisciplinary Institute.

TORRE, Saturnino de la y María MORAES (2005). Sentipensar: Fundamentos y estrategias para reencantar la educación. Málaga: Aljibe.

VARELA, Francisco (1995). "Haciendo camino al andar". En James LO- VELOCK et al. Gaia, implicaciones de la nueva biología. 3° edition. Barcelona: Kairos.

VELÁZQUEZ FERNÁNDEZ, Héctor (2009). "Transhumanismo, libertad e identidad humana". Thémata, Revista de Filosofía number 41. Sevilla: Universidad de Sevilla.

VERNADSKY, Vladimir I. (1945). "The Biosphere and the Noosphere". American Scientist, volume 33. North Caroline: Sigma XI, The Scientific Research Society, pp. 1-12.

VERNADSKY, Vladimir I. (1997). The Biosphere. Nueva York: Copernicus