

## **INSTRUMENTAL RATIONALITY, AS PROPOSED BY HERBERT MARCUSE: A KEY CONCEPT TO UNDERSTAND OUR RELATIONSHIP WITH NATURE**

### **ABSTRACT**

The main purpose of this paper is to show why the concept of “instrumental rationality” as proposed by Herbert Marcuse (especially in his classical book “One-Dimensional Man - Studies in the Ideology of Advanced Industrial Society”, 1964) is a key concept to understand our relationship with nature and the so called environmental crisis which include the standard western carnivorous diet with its unprecedented animal suffering, social disruptions and environmental impacts. Some aspects of our ill-based relationship with nature such as the grotesque, unethical and unscientific assumptions of vivisection and biodiversity loss (also related to our diet) will be highlighted. This paper finally proposes a critical “environmental education” - guided by a critique of the hegemonic Science, technology and the cultural industry - to transcend our dominant instrumental, mechanistic and specious paradigm and thus help building another rationality which treats the problems of our globalized world - which are interconnected and thus, inextricably linked to each other - under the light of a systemic and non-anthropocentric approach.

**KEY-WORDS:** Instrumental rationality; Environment; Educational and scientific paradigms; Relationship between human and non-human animals; Vivisection.

## **RACIONALIDADE INSTRUMENTAL, SEGUNDO HERBERT MARCUSE: UM CONCEITO-CHAVE PARA COMPREENDER NOSSA RELAÇÃO COM A NATUREZA.**

### **RESUMO**

O principal objetivo deste artigo é mostrar porque o conceito de “racionalidade instrumental”, tal como proposto por Herbert Marcuse (especialmente em seu clássico livro “A Ideologia da Sociedade industrial – o homem unidimensional, 1964), é um conceito-chave para compreender a nossa relação com a natureza, bem como a chamada “crise ambiental”, cuja discussão inclui, entre outras questões, a dieta padrão ocidental essencialmente carnívora, que causa um sofrimento sem precedentes aos animais, além de impactos sociais e ecológicos de grande magnitude. Alguns aspectos da nossa relação doentia com a natureza são destacados, tais como os pressupostos grotescos e pseudocientíficos da vivissecção e a perda de biodiversidade (também relacionada à dieta carnívora). O artigo propõe, finalmente, a adoção de uma “educação ambiental” transformadora que – guiada por uma visão crítica da Ciência que se tornou hegemônica, da tecnologia e da indústria cultural – possa nos ajudar a transcender o paradigma instrumental, mecanicista e especista dominante rumo a uma outra racionalidade que trate os problemas de nosso mundo globalizado – que encontram-se interconectados e

portanto inextricavelmente associados – sob a luz de uma abordagem sistêmica e não-antropocêntrica.

**PALAVRAS-CHAVES:** Racionalidade instrumental; Meio ambiente; Paradigmas educacionais e científicos; Relação entre animais humanos e não-humanos; Vivisseção.

## **RACIONALIDAD INSTRUMENTAL, SEGÚN HERBERT MARCUSE: UN CONCEPTO CLAVE PARA COMPRENDER NUESTRA RELACIÓN CON LA NATURALEZA.**

### **RESUMEN**

El principal objetivo de este artículo es mostrar por qué el concepto de “racionalidad instrumental”, tal como lo propuso Herbert Marcuse (especialmente en su clásico libro “La Ideología de la Sociedad Industrial - el hombre unidimensional, 1964), es un concepto clave para comprender nuestra relación con la naturaleza, tanto como la llamada “crisis ambiental”, cuya discusión incluye, entre otras cosas, la dieta padrón occidental esencialmente carnívora, que causa un sufrimiento sin precedentes a los animales, fuera de impactos sociales y ecológicos de gran magnitud. Algunos aspectos de nuestra relación enfermiza con la naturaleza se destacan, tales como los presupuestos grotescos o pseudocientíficos de la vivisección y la pérdida de la biodiversidad (también relacionada con la dieta carnívora). El artículo propone, finalmente, la adopción de una “educación ambiental” transformadora que - guiada por una visión crítica de la Ciencia que se tornó hegemónica, de la tecnología y de la industria cultural - pueda ayudarnos a trascender el paradigma instrumental, mecanicista y especista dominante, rumbo a otra racionalidad que trate los problemas de nuestro mundo globalizado - que se encuentran interconectados y, por lo tanto, indisolublemente asociados – bajo la luz de una visión sistémica y no antropocéntrica.

**PALABRAS CLAVES:** Racionalidad instrumental; Medio ambiente; Paradigmas educacionales y científicos; Relación entre animales humanos y no humanos; Vivisección.

### I. Introduction

During the second half of the twentieth century, starting roughly thirty years ago, the idea of “environment” apparently broadened to encompass not only its natural and technical dimensions, as commonly expressed by the dominant thought, but also the aspects resulting from human interventions<sup>1</sup>. Nevertheless, due to the

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<sup>1</sup>The “United Nations Conference on The Human Environment”, held in Stockholm in 1972, is considered a milestone in this matter.

hegemony of an instrumental rationality in our industrial society, the environmental question is still reduced, in most cases, to its natural and technical dimensions. This reduction is also a reification which is conducive to treating the environment almost exclusively by means of technical and scientific procedures. Strictly speaking there are many sciences. But the hegemonic science is “white” and European in origin and should be understood, of course, in a specific historical, social and epistemological context (BRÜGGER, 2004a).

One of the most brilliant and significant books about how to understand the hegemonic way of thinking and apprehending the world in our society was written in 1964 by the German philosopher Herbert Marcuse<sup>2</sup>. By enlightening and making deeply clear the premises underlying the ideology of advanced industrial societies, Marcuse’s *One-Dimensional Man*<sup>3</sup> - considered one of the most subversive and pessimist books of the 20th century - opens a new perspective to understand the environmental question as part of a greater crisis, the crisis of the dominant one-dimensional paradigm<sup>4</sup> which has been historically built on a series of epistemological ruptures in the western Reason, resulting in two main dimensions: an instrumental, repressive (the hegemonic one), and an ethical-political one, leading to emancipation.

It must be emphasized that it would be temerarious to summarize such a dense and rich body of knowledge as that which Marcuse presents in this monumental book.

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<sup>2</sup> Herbert Marcuse (1898 – 1979) was a German philosopher and sociologist, member of the “Frankfurt School”. His best known books are *Eros and Civilization* (1955) and *One-Dimensional Man* (1964), the book I refer to here.

<sup>3</sup>The book was first published in 1964. I am quoting the 6<sup>th</sup> printing (1968).

<sup>4</sup> It is not the purpose of this paper to discuss the definition of the polysemic word paradigm. Fritjof Capra (1996) proposes a definition of social paradigm – enough to fulfill the goals of this paper - based on Thomas Kuhn’s definition of scientific paradigm that is worth quoting: “a constellation of concepts, values, perceptions, and practices shared by a community, which forms a particular vision of reality that is the basis of the way the community organizes itself” (Capra, 1996:05-06). It is interesting to comment that according to Margaret Masterman (in GOODY, Jack. *La raison graphique - la domestication de la pensée sauvage*. Translated by Jean Bazin e Alban Bensa. Paris: Minuit, 1979:104-105), Thomas Kuhn in his “Structure of Scientific revolutions” refers to the word paradigm in more than twenty different ways. We should, in short, rescue other dimensions of Reason in order to build a new paradigm or “matrix” of rationality. Marcuse says that a metaphysics of liberation would be the reconciliation of Logos and Eros because classical formal and modern symbolic logic, transcendental and dialectical logic – each rules over a different universe of discourse and experience (MARCUSE, 1968:167).

I will just highlight - concerning the goals I have in this paper - what I consider essential to better understand the basis of our relationship with nature.

Marcuse starts his book arguing that the industrial society ideology is an irrational one because productivity of our society is destructive of the free development of human needs and faculties and that it may be distinguished from others by the use of Technology rather than Terror. This, he continues, is accomplished on the dual basis of an overwhelming efficiency and an increasing standard of living. He says that in a specific sense advanced industrial culture is *more* ideological than its predecessor because, today, the ideology is in the process of production itself. This proposition reveals, thus, the political aspects of the prevailing technological rationality, he concludes <sup>5</sup>.

I.1.The legacy of Herbert Marcuse concerning the roots of our relationship with nature: the emergence of a technological, instrumental rationality hegemony

Regarding his arguments in the section of the book called “One-dimensional thought”, and more specifically – “Technological rationality and the logic of domination”, Marcuse says that the science of nature develops under a *technological a priori* which projects nature as potential instrumentality, stuff of control organization. And the apprehension of nature instrumentality *precedes* the development of all particular technical organization (MARCUSE, 1968:153). Marcuse demonstrates the *internal* instrumentalist character of this scientific rationality based on a *a priori* of a specific technology – namely, technology as a form of social control and domination. He states that the scientific method which led to the ever-more-effective domination of nature thus came to provide the pure concepts as well as the instrumentalities for the ever-more-effective domination of man by man *through* the domination of nature (MARCUSE, 1968: 157-158).

Marcuse explains how and why this has happened referring - among other authors – to the teachings of Husserl which shows the extent to which modern science is the “methodology” of a pre-given historical reality within whose universe it moves.

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<sup>5</sup> In this paper I will use the term instrumental rationality rather than technological rationality because the first has become more current than the latter.

Marcuse argues that - in contrast to Piaget's rather psychological and biological analysis - Husserl has offered a genetic epistemology focused on the socio-historical structure of scientific reason. The below quotation is very elucidative:

"Husserl starts with the fact that the mathematization of nature resulted in valid practical knowledge: in the construction of an 'ideational' reality which could be effectively 'correlated' with the *empirical* reality. But the scientific achievement referred back to a *pre-scientific* practice, which constituted the original basis (the *Sinnesfundament*) of Galilean science. This pre-scientific basis of science in the world of practice (*Lebenswelt*), which determined the theoretical structure, was not questioned by Galileo; moreover, it was concealed (*verdeckt*) by the further development of science. The result was the illusion that the mathematization of nature created an 'autonomous (*eigenständige*) absolute truth' while in reality, it remained a specific method and technique for the *Lebenswelt*. The ideational *veil* (*Ideenkleid*) of mathematical science is thus a veil of symbols which represents and at the same time masks (*vertritt* and *verkleidet*) the world of practice" (MARCUSE, 1968:162-163).

Quoting Husserl again, Marcuse states that the original pre-scientific intent and content that is preserved in the conceptual structure of science is *measurement* which in practice discovers the possibility of using certain basic forms, shapes, and relations, which are universally 'available as identically the same, for exactly determining and calculating empirical objects and relations' (HUSSERL quoted by MARCUSE, 1968:163). Geometry is the theory of practical objectification and algebra and mathematical logic construct an absolute ideational reality, freed from the incalculable uncertainties and peculiarities of the *Lebenswelt* and of the subjects living in it. He also claims that the coordination (*Zuordnung*) of the ideational with the empirical world enables us to project the anticipated regularities of the practical *Lebenswelt* (and, again, quotes Husserl): the foresight of which is to be expected in the experience of concrete life (MARCUSE, 1968:163).

"Husserl emphasizes the pre-scientific, technical connotations of mathematical exactness and fungibility. These central notions of modern science emerge, not as mere by-products of a pure science, but as pertaining to its inner conceptual structure. The scientific abstraction from concreteness, the quantification of qualities which yield

exactness as well as universal validity, involve a specific mode of 'seeing' the world. And this 'seeing', in spite of its 'pure', disinterested character, is seeing within a purposive, practical context. It is anticipating (*Voraussehen*) and projecting (*Vorhaben*). Galilean science is the science of methodical, systematic anticipation and projection (...) – namely, that which experiences, comprehends and shapes the world in terms of calculable, predictable relationships among exactly identifiable units. In this project, universal quantification is a prerequisite for the *domination* of nature. Individual, non-quantifiable qualities stand in the way of an organization of men and things in accordance with the measurable power to be extracted from them” (MARCUSE, 1968:164).

Marcuse concludes that this specific socio-historical project and the consciousness which undertakes it is the hidden subject of Galilean science: the art of anticipation extended in infinity (*ins Unendliche erweiterte Voraussicht*). The scientific concept of a universally controllable nature projected nature as endless matter-in-function, the mere stuff of theory and practice. In this form, the object-world entered the construction of a technological universe – a universe of mental and physical instrumentalities; means to an end in themselves. Only in the medium of technology, man and nature become fungible objects of organization. The universal effectiveness and productivity of the apparatus under which they are subsumed veil the particular interests that organize the apparatus. In other words, technology has become the great vehicle of *reification* – reification in its most mature and effective form. The world tends to become the stuff of total administration, which absorbs even the administrators. The web of domination has become the web of Reason itself, and this society is fatally entangled in it. The transcending modes of thought seem to transcend Reason itself (MARCUSE, 1968:164-169).

Marcuse discusses, of course, the possibilities of transcending this relationship with nature but he warns us that precisely because Galilean science is in the formation of its concepts the technique of a specific *Lebenswelt*, it does not, and cannot, *transcend* this *Lebenswelt*. It remains essentially within the basic experimental framework and within the universe of ends set by this reality. There are inherent limits in the established science and scientific method, by virtue of which they extend,

rationalize, and insure the prevailing *Lebenswelt* without altering its existential structure – that is *without envisaging a qualitatively new mode of 'seeing'* and qualitatively new relations between man and nature. With respect to the institutionalized forms of life, science (pure as well as applied) would thus have a stabilizing, static, conservative function. Marcuse concludes that even in its most revolutionary achievements (science) would only be construction and destruction in line with a specific experience and organization of reality. This is the origin of an instrumentalist horizon of thought, a new world of theoretical and practical Reason (MARCUSE, 1968:164-165). The following quotation summarizes what lies in the core of, as well what we may expect from our hegemonic science:

“The quantification of nature, which led to its explication in terms of mathematical structures, separated reality from all inherent ends and, consequently, separated the true from the good, science from ethics. No matter how science may now define the objectivity of nature and the interrelations among its parts, it cannot scientifically conceive it in terms of ‘final causes’. And no matter how constitutive may be the role of the subject as point of observation, measurement, and calculation, this subject cannot play its scientific role as ethical aesthetic or political agent. The tension between Reason on the one hand, and the needs and wants of the underlying population (which has been the object but rarely the subject of Reason) on the other hand, has been there from the beginning of philosophic and scientific thought. The ‘nature of things’, including that of society, was so defined as to justify repression and even suppression as perfectly rational. True knowledge and reason demand domination over – if not liberation from – the senses. The union of Logos and Eros led already Plato to the supremacy of Logos; in Aristotle, the relation between the god and the world moved by him is ‘erotic’ only in terms of analogy. Then the precarious ontological link between Logos and Eros is broken, and scientific rationality emerges as essentially neutral. What nature (including man) may be striving for is scientifically rational only in terms of the general laws of motion – physical, chemical, or biological” (MARCUSE, 1968:146-147).

1.2. Some comments on Marcuse’s thesis concerning the environmental question

Considering that the academic world is also guided by this one-dimensional paradigm and that the so called scientific world is considered the most trustworthy source of knowledge upon which recommendations are put into practice through social and environmental policies and strategies, the need of a new rationality in science becomes evident. But, to accomplish this, we must question the very basis of the scientific dominant “lens” through which we perceive, deal and design our world - and thus our environment - in its most primeval roots. In the times we are living in, times of such deep and rapid transition of values, what we most need to question are the relationships between humans and the rest of the biosphere, including the non-human animals, and realize that it is not “man who is destroying nature” but a specific dimension of Reason:

“Science, *by virtue of its own method* and concepts, has projected and promoted a universe in which the domination of nature has remained linked to the domination of man - a link which tends to be fatal to this universe as a whole” (MARCUSE, 1968:166).

Indeed, the world scenario today is one of a single mono-cultural technical productive model ravaging the biosphere and promoting ethical, aesthetical and “gen(ethnical)” destruction. We must, therefore, transcend this one-dimensional prison of thought and behavior in which nature has only instrumental value and is seen as a mere collection of resources, as a part of the productive system. Other emblematic traits of our culture are productivity as an icon <sup>6</sup> – and its direct implications on economic growth; anthropocentrism and speciesism; the pragmatic character that knowledge has acquired and a fragmented, narrow, mechanistic perception that has eventually promoted a rupture between us and the environment.

The environment must, then, be regarded as the result of our interaction with everything that surrounds us, living and non-living matter, what is “inside” and what is “outside” us. It is interesting to stress that, in a wide sense, we can say that our *Lebenswelt* is our *Umwelt* <sup>7</sup> in the specific sense that both concepts relate to a “veil of

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<sup>6</sup> See, for instance, Hanna Arendt in her book “The Human condition”.

<sup>7</sup> The German word *Umwelt* means “environment” or “surrounding world”. Jakob von Uexküll (and Thomas A. Sebeok) relate this term to the biological (and other) foundations that lie at

ideas” (*Ideenkleid*) through which we build and experience the world. The *Umwelt* - German expression for environment - is also our *Lebenswelt* if we see the environment as a social, political, cultural, aesthetical, and ethical creation. Our environment - “*Um-Lebenswelt*” - is made up from choices we make. It is a construction, rather than a “given” world. At the core of our environmental crisis lies our relationship with nature: extinction, pollution, depletion of natural resources, ill-treatment of animals and people etc are only “symptoms”.

II. Some inevitable consequences of our instrumental, one-dimensional rationality

As long as we see nature and people as a collection of (natural and human) resources - in other words, as “means” - and our main icons are productivity; efficiency; and economic growth to achieve higher standards of living (sic), we shall have unsustainable relationships with the biosphere. Sustainability has at least three basic dimensions: ecological; social; economic. Some authors (as the eco-socio-economist Ignacy Sachs) suggest the inclusion of other dimensions such as political, cultural or geographic, but sustainability requires an ethical dimension. The problem is that Science has become separated from Ethics because ethical issues are not quantifiable, they cannot be subjected to numeric expressions.

Besides, “development” should not be seen as just “growth”. Development should be a qualitative parameter, as proposes the ecological economist Herman Daly<sup>8</sup>, not a quantitative one. This requires a critical knowledge about the purpose of

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the core of the processes of communication and signification in both human and non-human animals. The term refers to a subjective universe in contrast with the expression *Umgebung*. According to Jakob von Uexküll’s systemic approach, the mind and the “objects” are inextricably linked because the mind interprets the world for the organism. Living systems are constantly interpreting signs and “weaving” their own particular *Umwelt*. One of the consequences of the *Umwelt* theory is that humans can only have meta-interpretations on any organism’s lives (see, for instance, VON UEXKÜLL, Thure. *A Teoria da Umwelt de Jakob von Uexküll*. São Paulo: Galáxia, n.07, abr. 2004: 19-48).

<sup>8</sup> In this brilliant article, Daly, argues that “growth” means a quantitative increase in the scale of the physical dimensions of the economy, whereas “development” should mean the qualitative improvement in the structure, design and composition of the physical stocks of wealth that results from greater knowledge, both of technique and of purpose. A growing economy is getting bigger; a developing economy is getting better. An economy can therefore develop without growing, or grow without developing. He also criticizes the hegemonic idea

technique: technique should be at our command and subjected to a wider ethical context, not the opposite. In fact Ecological Economics (see also MARTINEZ ALIER, 1994) premises should guide our world economy because externalities<sup>9</sup>, like pollution, are not truly quantifiable; increasing levels of entropy (a consequence of productivity) will lead to collapse; social exclusion and destruction of diversities are inevitable, etc. We are nevertheless dominated by a one-dimensional technical model and “development” has meant the destruction of the diversity of techniques towards this single model, as also argues the Brazilian geographer Milton Santos (1994). From China to Brazil, we find the same cars (and jams), diet (and diseases), clothes and aesthetical patterns: a big (and sad) West.

II.1. “Appetite for destruction”: gen-ethnic diversity loss; unsustainable societies

Some highlights of our one-dimensional diet show that the environmental impacts are very huge. In Brazil, agriculture and cattle raising account for 69% of the water withdrawn from natural reservoirs<sup>10</sup> and in the Western portion of Santa Catarina State (southern Brazil) alone – 5.6 million pigs are responsible for 9.7 thousand tons/day of CO<sub>2</sub> (liberated from feces)<sup>11</sup>. In Brazil and throughout the world monocultures lead to higher mechanization; rural exodus and the “swelling” of cities; social conflicts; landlessness; ethnic violence etc. And now that more people in Brazil, India and China are ascending to this one-dimensional “middle class” pattern<sup>12</sup>, food prices rise due to this one-dimensional diet, among other factors.

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that economic growth is the only acceptable cure for poverty. DALY, Herman. “Boundless bull”. In: LAMAY, Craig L. & DENNIS, Everette E. (eds). Media and the environment. Washington, Island Press, 149-155, 1991. Also available in: <http://www.fs.fed.us/eco/eco-watch/ew910508>

<sup>9</sup> The concept of “externality” only makes sense in the realm of a fragmented scientific paradigm and from a reductionist perspective of what is a productive system. In a systemic perspective any “externalities” would be recognized as internal parts of a given productive system.

<sup>10</sup> Agência Brasil (16/11/2006); site Ambiente Brasil / “Agropecuária é a atividade que mais consome água no Brasil, segundo relatório”.

<sup>11</sup> Agência Câmara (30/03/2007); site Ambiente Brasil / “Suínos geram 9,7 mil ton de CO<sub>2</sub> por dia em Santa Catarina”.

<sup>12</sup> In Brazil chicken consumption rose 51% from 1995 to 2005/ <http://www.mp.go.gov.br/porta/web/hp/4/docs/trf3baurufiscalizacaoaquacarne.pdf>

“Sustainable development” is a synthetic expression which has become a kind of panacea and whose interpretations give this term the status of a real chimera. But what does development really mean? Or what is more important, what has development meant for the last two or three centuries in the industrial world? Although many possibilities could arise out of this meaning, the industrial world has made a very narrow reading of that expression. Guided by an instrumental rationality - which has resulted in the hegemony of a single technical model - “development” has been materialized as a rupture between traditional societies and their (social, ecological and cultural) ties with the environment. This process of unidimensionalization towards a technological culture is “pre-designed in this idea of Reason as a specific historical project”, argues Marcuse. Development has come to mean technical development, *tout court*<sup>13</sup> and the destruction of genetic, ethnic, ethical and cultural diversities some of its consequences (see BRÜGGER, 2004a; BRÜGGER, 2004c).

History also tells us that this hegemonic idea of development in our society is narcissistic because any technical, ethical, cultural or political model which does not “mirror” it is said to be primitive and savage. Thus many societies may be considered primitive or uncivilised because their relationship with nature is different from ours. But the truth is that we mention what they do not have: our technique (most of all); an Estate; written forms of communication; our ethical/aesthetical patterns etc, but not what they are. Like Narcissus looking at his own image our one-dimensional culture transforms a simple difference into a hierarchy and ecocide and ethnocide go hand in hand<sup>14</sup>. To transcend this we should think of “sustainable societies”, instead of sustainable development, because the latter term has become clearly divested of its historical and political meanings. And we should always ask (the ethical questions): Sustain what? Which “resources” will be saved and for whom: a small elite or for the majority; for humans only or for non-human animals too?

Biodiversity destruction is of course one more aspect of our one-dimensional diet. According to FAO, in the 20th century 75% of the genetic diversity of thousands

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<sup>13</sup> Sustainability, of course, does not escape this paradigm and has been interpreted in most cases in terms of “optimum pollution levels” and “carrying capacity”. The problem is that these concepts do not account for the complexity involved in the relationships between the industrial society and nature and should never substitute ethical decisions.

<sup>14</sup> See GONÇALVES, Carlos W. P. *Os (des)caminhos do meio ambiente*. São Paulo, Contexto, 1989.

of plant species disappeared. And of 7,000 cultivated species, there are only 150 in our diet today. We have also lost micronutrient diversity<sup>15</sup>. Where did these species and varieties go? Because they are threatened in nature (*in-situ*), seed banks (*ex-situ* conservation) like *Svalbard Global Seed Vault*<sup>16</sup> become a must: this is another consequence of the widespread mono-cultural (one-dimensional) “grain model”<sup>17</sup>. Because of the hegemony of grain models, *Svalbard Global Seed Vault* and other germoplasm banks are a “necessary evil”. Some may argue that these banks are an undisputed expression of our deep concern about biodiversity conservation. But things should be seen otherwise. In fact, this displays the diseased quality of our relationship with nature.

Yet is that enough? No. Seeds are at the base of food chains. At the top, predators are losing their habitats. A mother feline cannot teach her cub anything but how to hunt. They are not “moral agents”. In lack of their natural preys they cannot see cattle otherwise but as food. So, countries like Brazil which subscribe to the *Convention on Biological Diversity* but have such agricultural policies are not responsibly complying with the treaty<sup>18</sup>. And countries that buy grains produced under

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<sup>15</sup> See EPSTEIN, Samuel & HAUTER, Wenonah. Hooked on nuclear irradiation too? *The Ecologist Report*, jun.2001: 41-43.

<sup>16</sup> The Svalbard Global Seed Vault is a seed bank located on the Norwegian island of Spitsbergen near the town of Longyearbyen in the remote Arctic Svalbard archipelago. The facility was established to preserve a wide variety of plant seeds from locations worldwide in an underground cavern (resumed from the *Wikipedia*)

<sup>17</sup> There are two basic trends in plant domestication: the “grain model” - basically the domestication of cereals etc (as soy and corn) for ‘agriculture’ - a monocultural model that suits the interests of “developing countries” concerning the exportation of commodities for animal food; and the “garden model” - a horticultural model conceived for multiple purposes which is the main component of indigenous agriculture in the tropics and helps maintaining biodiversity. See Genevieve Michon and Hubert de Foresta in: *Agroforestry in Sustainable Agricultural Systems* edited by Louise Buck; James Lassoie and Erick Fernandes; published by CRC Press, 1999. See also <http://www.fao.org/docrep/w3735e/w3735e21.htm>

<sup>18</sup> Many human societies have never had a significant impact on nature. It is, thus, quite unfair to state that “*Homo sapiens* is destroying nature”. In fact, in many situations the so called “primitive” societies had positive impacts on nature in terms of improving biodiversity (see, for instance, ANDERSON, Anthony B. & POSEY, Darrell A. Management of a tropical scrub savanna by the Gorotire Kayapo of Brazil. *Advances in Economic Botany* 7:159-173, 1989). It seems that, on the other hand, societies which apparently show concern about biodiversity and have even subscribed to the *Convention on Biological Diversity* - as is the case of Brazil - adopt social, environmental and agricultural policies which inevitably attempt against biodiversity. Agricultural practices designed to produce large quantities of grains and meat are inherently bad because they enhance one of the most important causes of biodiversity loss: the simplification and destruction of habitats (see BRANFORD, Sue & FRERIS, Nicole. One great big hill of beans. *The Ecologist*, 30(3), 2000: 46-47; KIMBRELL, Andrew (ed.) *Fatal*

such circumstances are loading the guns to shoot felines and other top predators, as well as subsidizing plant diversity destruction worldwide.

We are promoting a war against autopoiesis, a war against life<sup>19</sup>. Our monocultural model is literally “autophagic” Our energy system - to feed people and machines - demands a productivity that promote slave labor; hunger; wars; unfair trade and ethnic violence. These are a few consequences of

(...) “a pattern of *one-dimensional thought and behavior* in which ideas, aspirations, and objectives that (...) transcend the universe of discourse and action are either repelled or reduced to terms of this universe. They are redefined by the rationality of the given system and of its quantitative extension” (MARCUSE, 1968:12)

## II. 2. Unprecedented suffering to sentient beings

In a context where human and non-human animals are seen as means to our ends, especially non-human animals are “treated like machines that convert fodder into flesh, and any innovation that results in a higher ‘conversion ratio’ is liable to be adopted. Cruelty is acknowledged only when profitability ceases”, argues Peter Singer<sup>20</sup>.

Deprived of intrinsic value non-human animals become means when the goal is efficiency. Through an instrumental lens they cannot be seen as worthy of the moral status that is the basis of rights, or as subjects of a life, as argues Regan (2001). From chicken to veal, non-human animals must endure an endless list of sufferings in factory farms: confinement; stressful conditions; boredom; mutilation; premature death. “In Brazil, only in the year of 2006, 48 pigs were killed per minute (25.5 million pigs) and 123 chickens were killed per second (3.9 billion chickens). Chickens live

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*Harvest - the tragedy of industrial agriculture*. Foundation For Deep Ecology/ Island Press, 2002; BRÜGGER, 2004b among others).

<sup>19</sup> An emblematic example is the terminator technology. Vandana Shiva (in *The Corporation*) argues that “one must have a brutal mind to conceive of a terminator technology. It’s a war against evolution”. Yes, it is a war against autopoiesis at all levels, only conceived by a one-dimensional mind, dominated by efficiency and productivity.

<sup>20</sup> Excerpted from *Practical Ethics, Cambridge, 1979 - Equality for animals?* Available at: <http://www.utilitarian.net/singer/by/1979----.htm>

only 1.7 % and pigs 3.8% of their full life expectancy”<sup>21</sup>. This bloodshed is possible based on efficiency (sic) designed protocols and other “technical” procedures. Also, slaughterhouse workers are subjected to brutal activities and acquire physical and psychological illnesses<sup>22</sup>, doing the “dirty work” that we used to do when we were “hunter-gatherers”. Yet, according to the NGO *Repórter Brasil*, cattle raising is responsible for 62% of slave labor in Brazil <sup>23</sup>. Is that “rational”? Yes, if we think that

“Modern man takes the entirety of Being as raw material for production and subjects the entirety of the object-world to the seep and order of production (*Herstellen*).”...the use of machinery and the production of machines is not technics itself but merely an adequate instrument for the realization (*Einrichtung*) of the essence of technics in its objective raw material” (MARTIN HEIDEGGER quoted by MARCUSE, 1968:153-154).

And as higher are economic growth and incomes, urbanization and industrialization, higher is the demand for animal protein. This trend is dominant, in spite of warning signs. Diets based on high animal protein consumption together with the ingestion of more fat and less fibers are associated with cancer, heart diseases, obesity, etc<sup>24</sup>. Some could argue that exploitation of humans and animals are part of all human cultures in all times. But, as argues Marcuse, “the scientific method provided the instrumentalities for the ever-more-effective domination of man by man through the domination of nature” (MARCUSE, 1968: 158). Much of the sufferings that sentient beings must abide are facets of a single problem: greed - a human defect that can flourish pervasively under our instrumental rationality.

Much more could be said about this specific subject but I will conclude by examining the most refined form of ignorance that incarnates every evil Marcuse pointed out - the blind faith in vivisection: non-human animals are seen as means of a pseudoscience based on the false assumption that the ideational world can be

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<sup>21</sup> NEGRÃO, Silvio L. Uma análise do ciclo de produção agroindustrial de suínos e aves no Estado de Santa Catarina à luz da perspectiva crítica da ética global. 2008. Tese (Doutorado Interdisciplinar em Ciências Humanas) - Universidade Federal de Santa Catarina: 154; 192.

<sup>22</sup> See, for instance EISNITZ, Gail. *Slaughterhouse: the shocking story of greed, neglect, and inhumane treatment inside the U.S. meat industry*. New York: Prometheus Books, 1997.

<sup>23</sup> <http://ultimainstancia.uol.com.br/noticia/38073.shtml>

<sup>24</sup> See, for instance, “Diet, nutrition and the prevention of chronic diseases”. WHO (World Health Organization) Technical Report Series 916, Geneva, 2003.

correlated with reality.

“When the Society for the Prevention of Cruelty to Animals asked the Pope for his support, he refused it, on the ground that human beings owe no duty to lower animals, and that ill-treating animals is not sinful. This is because animals have no souls” (BERTRAND RUSSELL quoted by MARCUSE, 1968:237).

Marcuse continues:

“Materialism, which is not tainted by such ideological abuse of the soul, has a more universal and realistic concept of salvation. It admits the reality of Hell only at one definite place, here on earth, and asserts that this Hell as created by Man (and by Nature). Part of this Hell is the ill-treatment of animals – the work of a human society whose rationality is still the irrational” (MARCUSE, 1968:237).

Vivisection - another expression of our instrumental, anthropocentric, paradigm - may be questioned under at least three aspects: ethical; scientific; educational (concerning the educational aspect see JUKES & CHIUIA, 2003; FRANKLIN, PEAT & LEWIS, 2002; BRÜGGER, 2004b, among others).

Vivisection is a specious science that affronts the most basic ethical principle: it exposes sentient beings to physical or psychological suffering and eventually to death. Again - as in food production – non-human animals are seen as tools for research and education, deprived of intrinsic value. Non-human animals become means and the mere fact of being “means” is already unethical, regardless of the suffering: it is a deformed thought only considered “natural” in a mind dominated by an instrumental rationality. Besides, vivisection is a harmful pseudoscience because its data are unsuccessful in predicting phenomena concerning humans (BARNARD & KAUFMAN, 1987; GREEK & GREEK, 2000; 2003; LAFOLLETTE & SHANKS, 1996; FANO, 2000; BRÜGGER, 2004b, among others).

Many unscientific aspects of vivisection could be discussed. But “predictability” is a very important one because it turns vivisection into a dangerous endeavor for both people and the biosphere. And yet, there are many ways of explaining why vivisection fails in predictability. One of them is to show that animal models are not good Causal

Analogical Models (CAMs)<sup>25</sup> because according to the Theory of Evolution small genetic differences between species – “spread” over evolutionary time – result in huge qualitative differences. We can also understand why predictability fails using the concept of autopoiesis and other premises of systemic paradigms<sup>26</sup>. All these scientific approaches display a high degree of consilience and reinforce the “dialectics of nature” to explain the quest here. And as knowledge is, rigorously speaking, “metaphorical” we can also return to what Marcuse stated about Science and realize that vivisection fails because it is based on an unsuitable metaphor: the assumption that the ‘ideational’ reality (the animal model) can be correlated (exactly) with the empirical reality. Through animal models vivisectionists expect to quantify qualities which anticipate regularities of the practical concrete life (human diseases and other conditions), and allow the foresight of what is to be expected in nature etc. But a blind faith in “correlations that yield exactness” may lead to errors. For instance, “a single amino acid difference between human and non-human primates prevents HIV from binding to the same cell receptor in non-human primates” (GREEK & GREEK, 2003:49-50). The complexity of social and natural phenomena are not always susceptible to quantitative approaches. Tiny differences may generate huge effects. Relationships between components of living and non-living systems are a crucial issue<sup>27</sup>. In fact, “relationships make matter as (much as) relationships make music”<sup>28</sup>. As states Marcuse:

“(…) man had to create theoretical harmony out of actual discord, to purge thought from contradictions, to hypostatize identifiable and fungible units in the complex process of society and nature” (MARCUSE, 1968:137).

Vivisection can thus be successful just as much as someone who cannot play basketball can exhibit a good performance if he or she has an edited film in which all failed attempts were excluded. The Pharmaceutical Research and Manufacturers of

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<sup>25</sup> See LaFollette & Shanks (1996); Greek & Greek (2003).

<sup>26</sup> See BRÜGGER, Paula. “Porque somos contra os modelos animais – o reducionismo como base da falibilidade dos modelos animais”. Available at: [http://www.sentiens.net/top/PA\\_ENS\\_paulabrugger\\_06\\_top.html](http://www.sentiens.net/top/PA_ENS_paulabrugger_06_top.html)

<sup>27</sup> See CAPRA, Fritjof. *The web of life – a new scientific understanding of living systems*. New York, Anchor Books, c1996; especially pages 17 to 88

<sup>28</sup> Quotation from the film *Mindwalk* (1990), directed by Bernt Capra and based on Fritjof Capra’s book “The turning point”.

American estimate that only 1% of new medications tested in labs go on to human trials, and the FDA (Food and Drug Administration) eventually approves only 5% of these<sup>29</sup>. Is it science or chance?

The appalling truth is that any “success” obtained through vivisection is (or was) dependent on mass killing in laboratories: this is the way convenient data show up (positive correlations between animals and humans) and many models are “validated”. According to Jensen (2003), “in Europe alone an animal is killed in a laboratory every three seconds. In Britain it’s one every 12 seconds, in Japan one every other second and in the USA one per second”. Again, is that rational? Experiments on animals are an unethical practice anyway – even if the data were trustworthy and useful. But more pathetic is to claim that vivisection is the only way to study illnesses and other conditions that harm humans when alternative ways and substitutive methods were never given a chance – historically speaking - as hegemonic procedures.

The misery of vivisection continues because it feeds a lot of productive chains: animal suppliers; cages; funding; publications; scientists’ inflated egos, etc (see GREEK & GREEK, 2003: 27-32; 52-56). In short, productivity is money and “money makes the world go around”. Besides, pharmacological solutions are technical solutions, as much as other “cures” for the planet and people like bio-fuels to treat “climate change”, instead of a change in our habits<sup>30</sup>.

The rate of approval of new drugs has risen a lot, regardless of safety (GREEK & GREEK, 2003:106-119). But the crucial question still remains: what does “quantification of qualities” mean in concrete life<sup>31</sup>? Between us and chimps we find over 98% resemblance. Nevertheless, even potentially insignificant differences express themselves in unforeseen ways through time and space – through matter. In the example here we can either choose resemblance or difference. Are we so similar that chimps should be considered persons? Or shall the instrumental “reading” prevail

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<sup>29</sup> Reuters News Service, May 6, 1998; quoted by Greek & Greek (2000: 117).

<sup>30</sup> See BRÜGGER, Paula. “*Anima nobili x Anima vilis*”: nós, os senhores do universo e os outros animais, nossos escravos... [http://www.sentiens.net/top/PA\\_ENS\\_paulabrugger\\_09\\_top.html](http://www.sentiens.net/top/PA_ENS_paulabrugger_09_top.html)

<sup>31</sup> We can also question what kind of safety has a product whose label states, for instance, “maximum of 1% of transgenic component”. Maybe the same as drinking a glass of sewage where water is the major (99,9%) component. The supposed quantification of qualities (gene recombination) is not an exact science says Dr. Mae Wan Ho and other scientists. See, for instance HO, Mae-Wan. The unholy alliance. *The Ecologist* 27(4), 1997:152-158.

to label them as models? Again, this is an ethical, not a scientific issue. It is interesting to realize that the words we use are far more than a simple way of expression. They address us, always, to a specific universe of thought and action. When we call someone “savage”, “pig” or “dog”, we are expressing the speciesist and ethnocentric traits of our culture: the opposition between man and nature and between “culture” and nature. Also, when we say “human” or “natural resource” we are referring to a means of supplying what is needed, a stock that can be drawn on. The same is true for the words “human” and “non-human animals” that involuntarily express a dichotomical, discontinuous view, as Richard Dawkins tells us (1998:107-110). In fact we should see ourselves as a third chimpanzee as Dawkins and Diamond (1998; see also Dunbar, 1998) propose because this would be far more coherent in terms of evolutionary and biological classification, besides being a privileged way to express a *continuum* between us and “other” animals, and between us and the biosphere.

### III. Possibilities of change:

Cultural and behavioral changes may arise either from the realm of liberty – liberty understood as “the conscience of necessity” - or from the realm of coercion, a path to be accomplished through the application of laws. Although significant changes in society may arise from practices based on coercion, I believe that only in the universe of education is it possible to achieve the permanent, profound and revolutionary changes we need.

Due to the hegemony of the instrumental rationality here discussed, in most projects and educational strategies the concept of environment is still confined to its natural and technical dimensions and thus reified. In the domain of the so-called environmental education<sup>32</sup> this rationality favours a kind of technical instruction which is often more a “drilling” than real education. The apparently obvious but crucial point which has not been questioned is that the adjectives “environmental” or “green” reveal

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<sup>32</sup> Another milestone that should be quoted here, concerning the environmental education, is the *Tbilisi Conference*, held in 1977, in Georgia. It is interesting to stress that the main wide, systemic ideas of the Tbilisi Conference have been neglected or deemed along the last decades, which simplified and thus impoverished the epistemological bias opened up by this meeting. EE has sifted then to more a technical plan and narrow perspectives like just “training teachers”, instead of educating for new values have become popular. The question is: can we really *train* people to become *environmental specialists*? Only in the realm of a reified concept of environment it is possible to talk about mere training.

the existence of a “non-environmental” instructional process which is our traditional education. This establishes a tense dialogue with the dominant concepts that structure the western values and makes it clear that education as a whole should be “environmental”. But in order to have genuine education and not a drilling practice we must apprehend the interconnection between things, which means not to deprive potential “generating themes” (as vivisection or the standard western diet discussed here) from their “thickness” in time and space and treat them as a-historical and a-political matters. Most concepts that dwell at the base of our minds constitute the non-environmental structure of our culture and it is not by providing abundant information about a reified vision of the “environment” that we shall approach the crucial issue: why does our society have this specific relationship with nature?

Many teachers who talk about introducing an “environmental dimension” in education argue that the saturated curricula cannot bear any more information. In fact we do not necessarily need more subjects, but the incorporation of “new” paradigms and rationalities which will provide elements to build another ethos between us and nature. This could be accomplished through epistemological bias because “epistemology is in itself ethics, and ethics is epistemology” (MARCUSE, 1968:125). This is the only way to a genuine revolution where “think globally and act locally” would no longer be thinking about, or looking at the whole world through the same mechanistic, instrumental paradigm.

No one can tell if we really are to enter a new era in the society-nature relationship. But we cannot just sit and wait for a new era of solidarity where perhaps hunger, animal suffering and depletion of (natural and human) resources will be only a memory of the past. Through this journey of survival we should also ask: educate for what and for whom? That would be a way to avoid euphemisms and prevent fashionable expressions from impoverishing, rather than enhancing, the rich possibilities at our disposal for building a better world (BRÜGGER, 2004c).

10 principles for a critical Environmental Education<sup>33</sup>:

Environmental Education (should or must)...

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<sup>33</sup> Excerpted and resumed from Brügger (2004c: 164-167).

Principle 1: Build a contra-hegemonic body of knowledge and constitute a new epistemic field. The mere choice of conventional themes (like extinction or waste/recycling) will *NOT* turn education green. It should also be a permanent process, involving the whole society.

Principle 2: Adopt non-anthropocentric (zoo-bio-ecocentric) paradigms and teach how to refrain from exerting power over “others” regardless of form (racism; sexism; imperialism, etc).

Principle 3: Recognize the limitations of Science and Technology regarding many issues, like the environmental question.

Principle 4: Emphasize inter, multi and trans-disciplinary approaches.

Principle 5: Accept the interwoven aspects of reality which encompass us and the environment: the biosphere and the noosphere are one: our thoughts, feelings and actions are inextricably linked; the “outside” and the “inside” are one single thing.

Principle 6: Recognize the value of non-industrial forms of knowledge and all sorts of traditional and tacit knowledge.

Principle 7: Stimulate permanent debates because a conflictive perspective in education helps building a new rationality by rescuing the bi-dimensional perspective proposed by Marcuse<sup>34</sup>.

Principle 8: Consolidate an ethics that might allow our personal attributes to flourish, as long as other people and life forms are respected.

Principle 9: Establish an equilibrium between the cognitive and the affective dimensions of the educational process.

Principle 10: Promote altruistic values and eco-actions, re-linking us to nature “*tout court*”.

#### IV. Final words...

Is it legitimate to talk of a “post-industrial” society, or a “knowledge society”, without questioning the very roots of our knowledge? Labels may change, but we

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<sup>34</sup> “Philosophy originates in dialectic; its universe of discourse responds to the facts of an antagonistic reality. To the extent to which the experience of an antagonistic world guides the development of the philosophical categories, philosophy moves in a universe which is broken in itself (*déchirement ontologique*) – two-dimensional” (MARCUSE, 1968:125).

remain in the same universe of thought and behavior - in the same rationality - which has been destroying life:

“The union of growing productivity and growing destruction; the brinkmanship of annihilation; the surrender of thought, hope (...); the preservation of misery in the face of unprecedented wealth constitute the most impartial indictment (...) of this society” (MARCUSE, 1968: xiii)

Marcuse anticipated in many aspects the notion of Risk Society (*Risikogesellschaft*), proposed by the German sociologist Ulrich Beck<sup>35</sup>: Risk is inherent to a society guided by Instrumental Reason (BRÜGGER, 2004c:49). “The transcending modes of thought seem to transcend Reason itself”, argues Marcuse:

“History is the negation of Nature. What is only natural is overcome and recreated by the power of Reason. The metaphysical notion that Nature comes to itself in History points to the unconquered limits of Reason. It claims them as historical limits –as a task yet to be accomplished, or rather yet to be undertaken. If Nature is in itself a rational, legitimate object of Science, then it is the legitimate object not only of Reason as power but also of Reason as freedom; not only of domination but also of liberation” (MARCUSE, 1968:236).

Marcuse pointed out the relevance of contra-hegemonic forces (minorities, outsiders, and “radical thinkers”) in the effort to build a radically different universe of thought and behavior. Would veganism<sup>36</sup> be a privileged way?

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<sup>35</sup> Reference to the book and concept of “risk society” (*Risikogesellschaft*) proposed by the German sociologist Ulrich Beck.

<sup>36</sup> Veganism is a diet and lifestyle that seeks to exclude the use of animals for food, clothing, or any other purpose. Vegans endeavor not to use or consume products derived (wholly or partly) from animals of any kind. The most common reasons for becoming a vegan are ethical commitment or moral convictions concerning animal rights and the environment. Of particular concern are the practices involved in factory farming, animal testing and the intensive use of land and other resources required for animal farming. The word vegan was originally derived from “vegetarian” (1944) when Elsie Shrigley and Donald Watson, frustrated that the term “vegetarianism” had come to include the eating of dairy products, founded the UK Vegan Society (resumed and adapted from the *Wikipedia*).

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