International Journal of Computing Anticipatory Systems, vol. 19, pp. 3-16 (2006) [Proceedings of CASYS'05, 7th International Conference on Computing Anticipatory Systems, Liège, Belgium, August 8-13, 2005], Ed.: D. M. Dubois, Publ. by CHAOS, 2005.
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Scientists' Responsibility and Scientific Concern for Evolution of Planet Earth: A Manifesto on Action for the World's Peace and Harmony

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Foreword

This article represents the final contribution of our friend Michel Bounias, prepared in 2001 as the Manifesto /Working Document for an international conference devoted to the ecological problems of our planet and the relationships between Life, Humanity and Earth. The original title and authors of the article was:

Manifesto from Scientists **Planet Earth 2001**

Science Responsibility and Scientists Concern for Evolution of Planet Earth : a Manifesto on action for World's peace and harmony

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After major organizational problems in creating such a conference (the symposium on "Science and the future of Planet Earth"), we planned to continue to work on the hard scientific foundations of the project during the CASYS'03 conference in Liege. In the meantime, Michel passed away. In order to expose this Manifesto (which was written beautifully and categorically – characteristic of all Michel's works), to the scientific and intellectual community, we decided to present it on CASYS'05 with the last review we have. Because Michel was actually the key person of preparing this documents and put coauthors in inverse alphabetic order, we decided to put him on the first place. All others should remain the same. We hope that this would not have annoyed Michel. In such a way this document will stay as a spiritual monument to Michel in memory of his unfinished project (see www.globalprojectmb.org for more). Michel and his Manifesto are worth that. With this, we hope that all his ideas shared with the coauthors will rest in peace but not in vain...

Coauthors

Abstract. During recent centuries, human technologies have grown to such an extent that their power has reached a level and a range comparable to that of natural forces. An increasing load of damage has resulted from the consequences of human population growth and development, with poverty, stress and violence still spreading in every part of the world. While political and industrial lobbies argue against the capability of science to give them lessons of objectivity and wisdom, religions have also failed to provide adequate guidelines for the way humanity should behave in harmony with the whole of the living community, and religious wars still rage worldwide. The three parts of the present appeal successively deal with the following parts of the tragedy: (i) the technological and economical aspects; (ii) the social and philosophical implications; (iii) the moral and spiritual messages.

A new way of thinking about identification of correct behavior and management that would allow the living community to evolve towards a optimum future is sketched and the whole of the scientific community is invited to contribute out of conflicts of interest to fill the appeal with the wisdom that Science should be able to bestow to humanity, in conjunction with Arts and Philosophy whose contribution is emphasized.

Key words and phrases: Alternative paradigms in World's management; Equitability in distribution of ecosystems' services; Mind and spirit for global peace and harmony; Scientifically founded ethics ; Whole living communities' rights.

Introduction

Groups in human societies used to decide on the laws that they imposed on the rest of their communities, even deciding of life and death of any kind of beings, humans, animals, plants and microorganisms. However, if it happens that these laws demand more from Earth than Earth can provide to life, in last instance the ultimate word will come from the voice of Universe. As Cairns (2000) stated: *"if humans cannot solve these difficult carrying capacity problems with reason, creativity, and intelligence, nature will solve them"*. In other words, *"the little creatures that have always run the world will be ready to take full charge of the planet if the creatures with the big brain fail"* (Cairns, 1999a).

So far, the Planet has carried two main phases of human civilization that have been depicted, after Quinn (1992), first as "those-who-let" (i.e. populations who just picked what was necessary for life, without destroying their ecosystems resources) and then "those-who-take" (i.e. societies who dominate other species up to elimination, and exploit resources up to exhaustion). At the present stage of the second phase, exhaustion of resources and degradation of the Planetary life-support system actually questions the further habitability of Earth (Shojit, 1989; Daily *et al.*, 1997; Edwards and Pimentel, 2000, etc.). Not only just a small part of the human population enjoys acceptable conditions of life, but even this privileged fraction is exposed to stress and struggle from social competition, criminality, terrorism and war, a trend which is logically worsening with time (Homer-Dixon, 1991). Then, the resulting massive use of psychotropic drugs in turn produces dramatic adverse effects (Zarifian, 1996; Vue-Desingue, 1997). However, appeals from scientists most often face the resistance from corporations that benefit from the present situation. While denial and betrayal escape scientific argumentation (Orr and Ehrenfeld, 1995; Ehrlich and Ehrlich, 1996), claims from economists that new technologies will solve the problems raised by a continued growth of human populations on a finite world mask the reality (Costanza, 1989; Hall and Hall, 1993). So far technologies have essentially introduced more new problems without solving former ones. For example, crop protection may presently fail by up to 40 to 75% losses, despite pesticides (Edwards and Pimentel, 2000), and pesticide residues raise an increasing threat to humans (Hileman, 2000a) in addition to other

living organisms, while both direct and indirect effects of children's exposure to industrial chemicals and pollutants remain poorly addressed (Hileman, 2000b). Paradoxically, where the contemporary lifestyle is high, at a moment, it however remains more demanding than technologies can help for making life more easy and less stressful. Furthermore, while the communication of science with politics remains unsatisfactory (Hardi, 2000), Burdyuzha (2000) has indicated that half of the human scientific potential is involved in military research and use, with all the scientific discoveries being turned into means of destruction and annihilation. Even modern medical practice turns to be far less efficient than it is usually said to be (Vue-Desingue, 1997; Salomon, 1998) and the "coming plague" of new pathogenic diseases (Garrett, 1997) remains threatening, since former antibiotics are losing efficacy, while new ones exhibit increasing side-toxicity (huge amount of literature is appearing weekly on the subject). Consequently, the reality of the claimed increase of life expectancy is flawed by the duration of diseases and disability experienced by a large proportion of people. Recently, the World Health Organization has rightly introduced a correction to the data, called DALE (for "Disability Adjusted Life Expectancy"). The new indices show that a number of populations remaining closer to a "Those-who-let" standard, experience a health situation comparable to that of industrial countries.

However, the 'exemptionalist' doctrine (Myers and Simon, 1993) still claims that humans are free of natural constraints that govern all other living species. Then, there is conflict about what is the truth. An objective assessment of truth should be a task shared by the parts of both scientists (for the 'hard' side), and thinkers, philosophers and artists (for the 'soft' one), who can be demonstrably shown to act free of conflicts of interest.

This opens on the need for foundations and formal justifications of guiding principles that would be universally applicable, and not just applying at some time to some people in some countries under some circumstances. Thus, Hardi (2000) rightly raised the question : "Does ethics become an internal part of science?" and Cairns (2000) proposed a "Declaration for World Peace and Sustainability" as guideline.

1. Scientific preliminaries

Statement 1. The structures and functions of universe are embedded in the structures and functions of life. In effect, (i) without atomic and molecular cohesion, no living organism could be built on molecular structures, and (ii) life cannot be sustained out of a corridor of biologically-compatible physical conditions.

Said in mathematical terms, while life is characterized by finer topologies, it obeys conditions dictated by coarser filters of the total Universe topologies.

Remark 1.1. The fundamental nature of Universe, space and matter is still matter of debate, and knowledge about living phenomena is growing at a mechanistic (molecular, physiological, psychological) level, though it remains mysterious in its essence, including at the level of spirit meaning and of mind and matter controversies.

However, even if underlying structures still are unknown, some general features are repeatedly and sufficiently established so as to be considered as kinds of "scientific laws". In this case, a so-called "scientific law" is a working hypothesis, since observation can be flawed by important errors of both perception and interpretation.

Statement 2. There exists a kind of scientific truth founded on both abstract and pragmatic bases, and on both human-independent and human-dependent realities.

Said otherwise (Chandler, 2000), on one hand "The specific nature of a

scientific truth is inseparable from logic", and on the other hand "Trans-disciplinary science is grounded in the concept that nature is truthful; that is, a set of relations among a set of facts can exist, despite well-separated reference systems". This is consistent with accessibility to a 'sup' of knowledge through a Global Project (Bounias *et al.*, 1999).

Contrary to some ideological claims: (i) the mathematical world is not just an invention of humans, but it rather reflects a profoundly underlying reality that cannot be falsified (Schwartz, 1997) and (ii) the mathematical indecidability cases do not preclude scientific objectivity. Instead (Bounias, 2000a): *" the most striking force of mathematics is that it cannot prove what is false within a well-defined system, or cannot be proved"*, which essentially contrasts with interest-directed promises and claims from "the many ideologies that have for centuries driven humanity on the way to domination and destruction". Then, a scientific truth graph can be elaborated in a given area of applied science or knowledge, through creation of *"a coherent structure that connects (our) scientific experience with both philosophical languages and with mathematical formalisms"* (Chandler, 2000). These approaches could be further strengthened by using Formal Concept Analysis (Wolff, 2000).

Statement 3. Disruption of universe structures might preclude sustainability of life even in its unknown or remote forms, and disruption of our Planet life-support systems might preclude sustainability of life at least on Earth.

A related statement about continuity of ecosystems structures and functions will be presented below. Topological continuity of Universe would extend the range of risk to its remote parts (Bounias, 2000c).

Statement 4. Life on the Planetary Ecosystem is a evolutionary phenomenon. Evolution drives living species through intermediate stages towards one best fitting to some habitat and resources, including to optimum forms of coexistence with other species.

Remark 4.1. No living species can be objectively considered as the term nor as the top of evolution, since at a optimum steady state the greatest diversity of species should share with minimized competition the greatest diversity of habitat and resources (Moore, 1990).

Complementarity of functions, continuity of ecosystems and mutualism infer as conditions raised by ecology and supported by mathematics (Ramade, 1994; Bounias and Bonaly, 2000). Other issues drive to degeneration of the systems.

Remark 4.2. Species presently classified as "noxious ones" by human societies also have a role in global evolution, and their temporary noxiousness is not a goal but the expression of an immature or a wrong stage of evolution. No eradication should be systematically planned since the ultimate utility of a species towards the rest of the community is not known at a time (Bounias, 2000b).

Corollary 4. A single species, e.g. *Homo sapiens*, has no right to artificially stop Evolution in view to self-establish its community as the term nor even the 'finality' of natural processes.

As Quinn (1992) subtly joked, had jellyfish stopped the evolution of other primitive organisms half a billion years ago, while they sustainably stood at the summit of life organization, then humans would not have existed.

Remark 4.3. While the Human species has privilege of growth in consciousness in its present phase of evolution, this in turn implies its growing responsibility. No one knows enough ecological "economy"! As pointed by Goethe (Faust): *" A man would*

live happily his life, if he wouldn't get his brain as a gift" (Kljajic, 2000).

Statement 5. A law cannot be decided by a group of people, nor even at unanimity of a population, unless an objective analysis of the situation and of the various issues predictable for the optional decisions has not formerly been achieved by researchers free from any conflict of interest with respect to the concerned nor related situations. The formal study and justifications must, in addition, have been clearly and totally made available to the community's knowledge. Hence, scientific assessment is a necessary though not always sufficient condition for guiding the behavior of human societies, as first indicated by Vannevar Bush (1950s).

Remark 5. If in these conditions a decision to allow a risk against a minority or even an individual, this decision cannot be validly imposed on potential victims.

This has contributed to the emergence of the 'precautionary action principle'.

Corollary 5. No law can be adopted against the general principles that drive the construction and evolution of life and ecosystems to optimum states of shared maximum richness and diversity. Eventually, even minute degradations of life support systems should be repaired and the functionality of the altered ecosystems rehabilitated (Cairns, 1999b). In this respect, emotional reactions should be rationally bounded (Cairns, 1998).

2. The material world of economics and technology

2.1. Towards healing of the economical disease

Human societies are wrongly minimizing interspecies competition by destroying their competitors. However, the next phase to be naturally expected from this phenomenon, i.e. an increase of intraspecies competition (Moore, 1990), has actually occurred. Instead of taking the form of emulation, which is a way of mutually beneficial challenges, that is a kind of mutualism, the human struggle for economical domination, holding on market, monopoly-establishing in clear or disguised forms, has resulted in mutual destruction through a generalization of up-to-death competition which develops during the growth of so-called "liberal economics" as well as it also raged during the previous "communist" and other forms of totalitarianism.

The correct solution resides in neither of these extremes, but instead in emphasizing the complementarity of skills, means, uses, cultures and geographical specificities of subpopulations. Similarly, the present forms of money and currencies too easily lead to criminal speculation and do not adequately reflect a worldwide human-workday equivalent. An equitable world economy should acknowledge the equivalence in value for exchange, of what any humans of from any part of the globe are able to produce within a day of their own work and capabilities.

Vocation should thus substitute for covetous careering in all professional areas.

In an intermediate phase, it is strictly necessary that all models of economical development take into account the cost of damage and of all short- or long-term adverse consequences of their activities, in an internalization of costs. This does not preclude the possibility of a future for trade activities, since environmentally correct forms of commerce have already been shown to be possible (Hawken, 1993). But now that anticipatory computing allows more powerful calculations, including prediction and management of chaotic phenomena (Tsirigotis and Naranjo, 2000), such issues could be more efficiently incorporated in alternative management strategies. This emphasizes the importance of scientific contribution.

2.2. The role of science

No 'official' form of truth can be dictated as a personal statement from those who hold money and power : *"a power cannot be responsible in ethical sense, because it is unipolar"* (Kljajic', 2000a). Instead, scientists, philosophers, artists, are able to reach a common agreement about a more general view of a well-founded ethics for a harmonious future. Science is able to gather the latter approaches into a general judgment about truth, needs, capability, utility, as opposed to politics views which place egocentric humanism on the top. In this sense, because science is able to justify for the role that philosophy and arts can play in a harmonious construction of the world, at least by identifying equivalence classes and categories, the inferring balance against the unipolar power would be multipolar and therefore compatible with an ethical nature.

It is not sufficient to remember the past and recent accidents, disasters, wars, cultural and historical destructions : crimes against nature and against the availability of natural ecosystems' resources must now be considered as a generalized conception of the former - and too restricted - "crimes against humankind" (Bounias and Bonaly, 2000).

Then, a correct analysis and interpretation of how Nature's equilibria have been constructed for hundred million years, will provide the appropriate solutions or trends toward correct solutions for the problems raised by centuries, if not millennia, of ill-considered and irresponsible human activities. Some damage to Earth may be already irretrievable, but in this respect, it pertains to honor of humankind's intelligence to contribute to the continuation of the evolutionary processes towards a best fitting of species to the largest variety and distribution of habitat and resources.

Since this implies full restoration of impaired Nature's services by new ecosystems, even different from the lost ones (Cairns, 1999b), then the assessment of corresponding requirements can be scientifically supported by known ecological and mathematical features

3. The social and philosophical world

3.1. Reasoning and feelings: two complementary components

3.1.1. First category of phenomena: science is the domain of the justifiable. All propositions dealing with nature's structures and functions need to be formally justified. Here, mathematics provides the background, physics gives the practical ways of measuring material objects, up to biological phenomena, at molecular, physiological, and up to ecosystems levels. When two categories of activities come in competition, the demonstrably less damaging to the ecosystem's structures and services should be favored.

3.1.2. Second category of phenomena: at psychological levels, besides the attempts to rationally understand how the mind functions, the realm of emotional feelings escapes the need for justifications: one feels what he feels, that is all.

In contrast, the nature of the acts which follow a feeling belongs to the former category. Targeted compassion has been shown to raise unsustainability (Cairns, 1998).

These considerations allow a complement to be introduced to the - so far incomplete - most general statement that had been formulated for nearly three millennia by Confucius, Buddha, Jain, Zoroaster, Mahabharata, Hillel, Jesus and others (Cairns, 2000). In its original forms the statement says: *"don't inflict to others what you would find undesirable or painful to you"*. This pertains to category 3.1.1, and applies to all organisms which form the global ecological life support system: however, evolution

towards consciousness of other's pain, distress or at least discomfort, appears as a clue.

In contrast, the taste, inclination and preference of living organisms for various optional life-parameters differ from one to another individual and constitute the form of rights pertaining to category 3.1.2. For example, one who likes strong music is not intended to force one who prefers to read in the silence, to be disturbed by a loud-speaker. Therefore, preferences of some should not be imposed to others. Kljajic' (2000a) has shown that even the consequences of psychological features on the impact of an individual's action can be described through anticipatory systems theory. Therefore, the assessment of what others would not like is an essential goal, and the perception of others' distress is a decisive sensor which has been emphasized in mythology (Bounias, 1985-1994) and should be matter of educational training.

The right of each individual to enjoy total freedom in his feelings is of a philosophical nature, but the measure of the impact of feeling-induced action belongs to the domain of science and cannot be imposed on others against their own feelings.

3.2. Education for altruism and mutualistic behavior

"Freedom to breed will bring ruin to all" Hardin argued in 1968. Hardin also pointed that *"Conscience is self-eliminating"* was remarked long before by Darwin who conjectured that " *Homo contracipiens* would become extinct and would be replaced by the variety *Homo progenitivus*".

In effect, on one hand, consider: *"appeals to an individual exploiting a commons to restrain himself for the general good - by means of his conscience. To make such an appeal is to set up a selective system that works toward the elimination of conscience from the race"* (Hardin, 1968). On the other hand, *"in the absence of environmental constraints, an invading species flourishes in the invaded community"* (Moore, 1990).

Therefore, it belongs to philosophical education to generalize this consciousness (second category) in educational programs, and to a new generation of lawyers to edify a new Universal Right, while science would provide the underlying framework for delineation of truth and identification of corrective feedbacks. It should be recalled that in his pioneering report, Malone (1994) stated that *"a holistic initiative is necessary for a global strategy of knowledge"*, with special emphasis to the importance of education of the world's populations. Such a initiative falls within the aims of this manifesto.

Applications to the identification and justification of moral behavior, civism, courtesy, are inferred from ecosystemic principles. Hence, mutualism implies that individuals should not demand the totality of their rights, but instead transfer part of their not-necessary ones to the benefit of other living organisms, in any form.

Remark. Tsirigotis (2000). Our modern "developed" societies have proven insufficient over time, to resolve these difficult problems, through the political and social systems which appeared along the way. These insufficiencies consist mainly of the refutation of [objective] values and in the failure of the creation of consciously active humans, firstly and furthermore citizens, who would gain knowledge of the essence of life through a philosophical approach. This could only be realized through a conscious and methodical effort in the educational system. As already shown by Malone (1994), appropriate education is a necessary condition that can lead us slowly but stably and surely to the reversal of this catastrophic course: that it has not been sufficient, up to now, inflicts a lesson on the present form of civilization.

3.3. Laws as subjected to the need for global consistency

A small number of laws endowed with general validity over any place,

everywhere, in any part of our accessible universe should be substituted to the intricate array of multiple and often contradictory laws which presently embroil human control over Earth management, and favour the development of fruitful criminal activities or dilute Justice attempts into juridical polemics. Both scientists, philosophers and artists should collaborate with a new generation of lawyers (say "ecosystemic lawyers") to the settlement of this new right.

New political rules must be inferred from this task. In effect, the concept of democracy is now obsolete, since it allows a minority of people to decide for the death of entire communities and/or of their life support systems, and to use armed forces to impose damaging and even suicidal decisions. The invoked pretexts usually just lie on subjective and opportunistic favouring of one community at the expenses of another.

The present systems of elections are no longer valid, since they essentially are based on a marketing principle. In effect, candidature is conditioned by the owning of influence and money, which often implies previous corruption or abuse of dominating position. Then, candidates of the current kind are unable to fulfill a further inescapable condition : i.e. to propose to electors accurate modelings of the different possible options, with comparative analysis of their issues in terms of cost and consequences at both short and long range, in space and time. Fitting of reality with expectation is a matter of scientific evaluation which should assess managers credibility or lack thereof. Automatic control systems could even be devised for this purpose (Theriou and Tsirigotis, 2000).

4. The field of arts and spirituality

4.1. The unknown is as much respectable as the known

Spirituality marks the higher step of generalization, since it makes reference to parts of the whole of "existing", which may even remain forever inaccessible to our perceptions. However, even parts of the total universe which may not be founded on the same topologies as our observable space-time may not be completely independent from our activities. In mathematical words, disjointed parts with respect to fine topologies may not be disjointed with respect to coarser topologies (Bounias, 1999). The consequence is that humans should be respectful towards the world they do not know at all, as for the small planet they (but partly) know. The expression "colonization" in space exploration research still is found in astrophysical papers (Krasnikov, 1998). Here, since planets from remote stars will be kept for at least some time (fortunately) protected from conquest (which implies inhabitant destruction, resource exhaustion and human waste deposition), and also (less fortunately) from scientific evaluation of risk of damage, it essentially falls to philosophy, arts and spirituality to call humanity's attention on moral oughts of humankind for further times.

In these acceptances, a cosmic consciousness has to emerge beyond egocentric humanism (Kljajic', 2000a). In a new view of property rights, being a owner would mean to be warrant of ecosystemic integrity (Collective work, 1999).

4.2. The unknown might be in some way reachable

The existence of space-time has been shown to involve an embedding 4-manifold (Bonaly and Bounias, 1995). In this case, parts of Universe could escape our usual 3-D senses. However, Méhois argues that Yogis doing some kinds of deep meditation (sometimes called 'transcendental') seem in fact to operate a simplistic assessment of the 4th dimension, and therefore gain a kind of perceptive access to remote worlds. Hence, even spirituality might not be separated from science. Some

reflections on related topics have already been mathematically documented by Rucker (1984) and Bounias (1999).

4.3. The power of mental phenomena

Mental and emotional communication between living species (not just between humans) is an important component of peace and harmony on Earth. Thoughts and feelings are full components of the universe, but while emotional feelings do not deserve to be justified, they may have a physical impact in terms of the 'inerton cloud' which is a particular kind of space deformation accompanying any motion of particle-like structures (Krasnoholovets, 2000). Since any feeling is at least supported by a cascade of molecular interactions between the brain cortex and limbic system (see Freeman, 1995 for review), thoughts may have physical effects independently from the actions they elicit.

Freedom in emotional communication must be a rule in arts where emotional exchange is a major goal or a major tool (Bounias, 1985). This means that no more lobbies must be allowed to dictate acceptation or rejection of artworks than must lobbies be allowed to dictate management organization to the profit of some privileged groups.

Discussion and Conclusion

Owing to the ambitious slogan of the French Republic "Liberté, Égalité, Fraternité", its underlying principles have not yet been really defined, and the slogan so far remained an impracticable device, eventually masked by 'official versions' imposed about facts and interpretations. The present analysis aims at providing these three words with a precise sense.

(i) Liberty is bound by both the carrying capacity of ecosystems, and the rights of other beings, including by clarified forms of the equality and fraternity concepts.

(ii) Equality is relative to the equitable distribution of ecosystems' services, resources and habitat, as well as equitable availability of educational and emotional communication among living species. It also includes an equal range of liberty for species evolution.

(iii) Fraternity is an acknowledgment of equality, up to self-restriction of practicable liberty: it may be another word for ecological mutualism. However, an education of people to the perception of the situation of others, of their difficulties, deprivations, stress and pain should be needed at both rational and emotional levels (Bounias, 1985-1994).

The epoch of "those-who-take", in the history of human societies, has been subdivided into several sub-phases (Burdyuzha, 2000): an ancient one has been leaded by religions, a further one has seen the blooming of arts, and the most recent one is under the domination of military power, closely related with industrial lobbies. So far, science was not ready to take the shift in hand. But now that all previous paradigms have exhausted their possibilities and most often failed to meet a balanced acme, since a harmonious development has not been reached, alternative ways should emerge, as predicted by ancient civilizations from India, Americas and Northern countries.

Science must now be prepared to impulse a paradigm of leading objectivity, and to share with its spiritual complementaries the task of offering to our Planet a new era of well-founded and authentic wisdom.

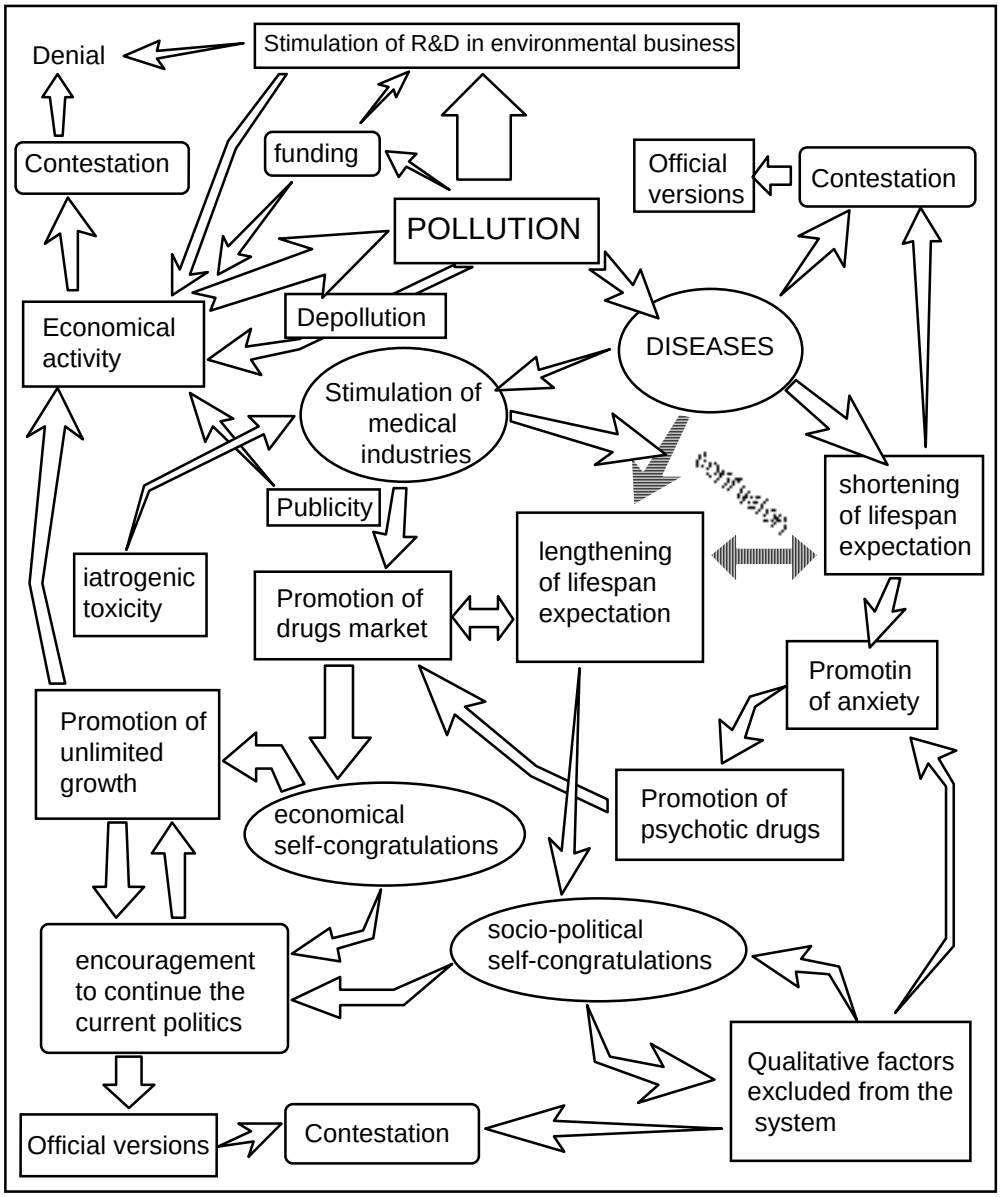

Figure. The management of human welfare as a successful profit-making job.

Acknowledgments

On behalf of all contributors of Manifesto, I would like to express my gratitude to Daniel Dubois who put this article in the plenary section, and Marc Bounias who provide me the last review of Manifesto from 2002 of his father and gave me many suggestions in order for the Manifesto to become more complete and coherent.

Miroljub Kljajić

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