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Laicality and secularity of Bioethics: why I believe in a biologically founded ethics

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Laicality and secularity of Bioethics: why I believe in a biologically founded ethics

All living forms are worthy of respect and of bioethical consideration as they keep promoting the DNA of the species and the preservation of its intraspecific variability. However, the ethical consideration varies and has a different weight according to different biological complexity and its ontogenetic cycle.

A first hierarchical level of value must be attributed to the specific DNA of a biological entity characterised by a haploid order of genes such as those of a bacterium, a gamete, a spore or an haplophyte.

The second hierarchical level leading to complexity in the history of life are the diploid entities, characterised by a diploid order of genes. They differ from the haploid because the fusion of the two haploid DNA filaments presupposes meiosis, which functions as a selective filter of casual mutations, the majority of which lead to the extinction of the haploid entity.

The third ethical level of complexity concern those animal species in which the concept of *individual* is present; individual being defined as a biological entity characterised by *uniqueness, unrepeatability, indivisibility* for the entire ontogenetic cycle (in other words, individuals resulting from the fusion of gametes produced by the meiotic process of parental generation) and in which the germinal line is potentially active in all individual members of the population. In these groups of living beings the preservation of the characteristic DNA of the species and its intraspecific variability is ensured by precise rules of socialisation.

The socio-intellectual control on the environment in the natural system operated by Humanity can represent the quality leading to the fourth hierarchical level of ethical norms.

The historically influenced bioethical behaviour of humans can be related to Morality which can assume different norms in different historical contexts. Morality could be therefore governed by religious or normalised by governments. Ethics is instead a pure biological and ecological discipline.

KEY WORDS: *Laicality, secularity, bioethical considerations*

Foreword

Religious ethics, medical ethics, personalistic ethics, political ethics, environmental ethics, business ethics, Bioethics: a sequence of qualifications of the term Ethics which tends to define new way of behaviour. The starting of the debate on Ethics can be dated in 1892 when Felix Adler (1851-1933) challenged Christian and Hebrew control over moral dogmas by founding the Society for Ethical Culture in New York.

Nowadays the terms moral philosophy and ethics are often mistaken for each other and this gives rise to misunderstandings.

So far, the development of ethical norms in Western culture has been based on the distinction between theological ethics and humanistic ethics. The former follows Aristotle's, according to whom everything has a ultimate goal that is God. On the contrary, humanistic ethics bases moral philosophy on man's own demands, first of all survival. So it appoints moral philosophy to guarantee the survival of man as an individual or as groups of individuals co-operating and living together in peace.

This duality of theological and humanistic ethics, peculiar to Western culture, runs contrary to the evolutionary reality, too often overlooking the fact that Mankind's first need is to survive as species. Existing ethical systems therefore now need to be supplanted by an ethic that is rooted in man's relation to his environment, as clarified by advances in scientific knowledge. From a Darwinian point of view, the first goal of humanistic ethics is clearly survival of the species and current ethical dogma too often overlook this fact. There is no need, in other words, for outdated ethical philosophies to be superseded by, or at least yield priority to, a new consciousness of "global bioethics".

Two innovative elements of reflection joined this crisis, or ideological renewal, during the first half of this century:

1) the ecological impact of man on environment: It started with the industrial revolution in the XVIII century, but it manifested itself during and after the 2nd World War, with a quick and explosive demographic increase of human population which changed from 1 billion in 1835 to 6 billion in less than 160 years (8 generations);

The ongoing upsurge of population that marks the turn of the millennium can be compared to the period of demographic expansion that followed the technological transition from the Palaeolithic to the Neolithic some 10.000-8.000 years ago, when the world's human population rose from an estimated 10 million to over 200 million. The introduction of agriculture, animal breeding, fermentation and food conservation enabled Mankind to overcome the ecological restrictions that by famine had controlled the population density of the hunters of the late Palaeolithic.

Mankind is currently witnessing a critical phase similar to the transition between the Palaeolithic and the Neolithic. This is a critical time when population growth and scarcity of vital resources and raw material interact.

2) the innovative impact of science: it started with the atomic physics, which destroyed the conceptual basis of matter with the fission of the atom. It was followed by biotechnology, which destroyed the concept of individual with the introduction of organ transplant, and by DNA chemistry and "genetic engineering" which had the same impact on the concept of species.

Will the development of "genetic engineering" enable us to provide for food, coal, oil and atom shortage as a source of energy? Will bio-engineering be able to produce cheap food which can satisfy the needs of a growing population? And if it does, how will we overcome shortages in the supply of drinkable water and sources of energy?

Will the biosphere be able to absorb the effects of the new technologies that are effecting dramatic changes in its constituents? Will Mankind be able to absorb the effects of these new technologies within a few years? Will governments be able to run such changes? Will politicians be able to consider these issues by the short time left? The present crisis can be overcome if the ethical problems concerning the applications of biotechnology and genetic engineering are solved.

The self-consciousness of problems

The Sixties and the Seventies were marked by the awareness of environmental issues and of the critical relationship between Mankind and Nature. This was the outcome of the remarks by scholars of various disciplines giving rise to new cultural movements with a strong focus on environmental. These remarks are summarized in the Stockholm Declaration on Human Environment (1972) where you can read:

We see around us growing evidence of man-made harm in many regions of the earth: dangerous levels of pollution in water, air earth and living beings; major and undesirable disturbances to the ecological balance of the biosphere; destruction and depletion of irreplaceable resources; and gross deficiencies, harmful to the physical, mental and social health of man, in the man-made environment, particularly in the living and working environment.

The quality of life and the quality of the environment are closely connected. This concept is confirmed by the final remarks of the intergovernmental conference on the environment (UNEP) which took place in Nairobi in 1982, (on the tenth anniversary of the Stockholm Declaration):

During the last decade new perceptions appeared: the effort to manage the environment, the deep and complex interrelationship between the environment, development, populations and resources. Population growth, especially in urban areas, gave rise to social tensions. A global, region-wide approach stressing these relations is going to promote a sustainable development.

With his typical brightness, Carlo Rubbia said:

We are witnessing an experiment where the test tube is the Earth. Moreover, we watch from inside, and nobody can guess what will happen.

The development of genetic engineering enables us to modify our genome and those of other species. Therefore, we must revise the idea of a Nature as environment exploited by Humankind and the unconscious use of biotechnology. Man must manage both environmental resources and his scientific heritage with a sense of responsibility.

Our present relationship with Nature is wrong. It is because the current establishment can raise neither conscious citizens nor upright statesmen. We must re-establish an Ethics based on responsibility and solidarity as a requirement for human salvation, as Van Potter stressed (1962, 1971 and 1993) a long time followed by Hans Jonas (1990) and Engelhardt (1991) and others.

The natural environment must be understood as a living system of which Mankind is an integral part. Environmental awareness requires us not only to consider the natural balance, but also to respect and recover it. This implies an attitude based on sharing and helpfulness in place of the exploitation peculiar to Western culture.

In this perspective, we must revise all those attitudes based on the exploitation of Nature and the unlimited use of biotechnology. We must enable Mankind to manage environmental resources and his scientific heritage. Nowadays ethical problems affect all sciences, but they are the main concern of biologists and natural scientists. The Ethics debate affects all scientific fields even if at the present it mainly interests medical discipline.

Man, or the Science that human evolution produced, looks at Nature as liveable environment (Ecology) and as matter which he himself and all other living organisms are made of (Comparative Biology). "*A reflection of the mind on matter, but the mind is made of that same matter*" (Chiarelli, 1995).

The history of ethical concepts and the birth of bioethics.

In tracing the development of ethical concepts, one can follow either a historical method or a naturalistic one. So far most scholars have followed the former.

Behind the metaphysical barrier, however, the whole problem subsists: the concepts of good and evil, fair and unfair, right and wrong, obedience and disobedience, obligation and liberty must be clearly systematised.

Today Mankind is constantly pervaded by such dilemmas, more than in the past, as it is frustrated by the responsibility of a continual choice and by the search for general rules to sort it out.

The concept of Ethics can also be analysed in a naturalistic and rational way: beyond a hedonistic/utilitaristic outlook of individual happiness as the only aim to pursue, as well as beyond a mystical vision of good as perfection to strive for. Science is regarded, in this case, as the only source of knowledge and the only way of coping with reality. In this formulation, the theological view of Ethics is meaningless. So we reach the bio-evolutionary position peculiar to the schools of Lorenz and Wilson.

According to Lorenz, animal and human behaviours are "*functions of a system created and shaped by a historical process turning in phylogeny*" (1978). According to Wilson, ethical values as well as physical characteristics may have developed and stabilised through natural selection, giving rise to a genetic evolution of moral predisposition. "*So in the human brain there are sensors that affect our ethical premises unconsciously and deeply; these roots develop into the instinct of morality*" (1978).

In Western culture there is no coding of Ethics regulating the interaction between Mankind and the Natural World. The relationship between Man and Nature, as A.S. Leopold asserts (1933), is still strictly economic. The Earth is only regarded as a property, and the rules regulating the relationship between Man and Nature only provide rights and no duty for Man in respect to Nature.

The extension of Ethics to the Natural Environment is required by evolution and the current environmental crisis. As clearly stated by Leopold this is the third stage of an evolutionary sequence (the individual ethics, clearly coded in the Mosaic Law, the development of democracy with the Roman Right) where the first two were already exceeded.

Bioethics is born in this context. Even if the real inventor of this discipline was Aldo Leopold with his book "A Sand County Almanac with other essays on Conservation" (1949), it was R. Van Potter (1971), who coined the term bioethics and defined it as the *science of equilibrium between Man and Nature and as a bridge for the future*.

In the *historical tradition*, the first forms of Ethics concerned relations between individuals and limitations of individual freedom towards others. "Others" includes those belonging to a definite social coexisting group such father, mother, son, daughter, husbands, wife, servants, etc. In addition ethics accounted for the property and pertinence belonging to each individual within this group. The Mosaic law, from fourth section on, is one of the more complete synthesis of these rules. The Mosaic "commandments", which were eventually integrated by cultural and ethnic traditions of different populations, served as the foundation of the *Judeo-Christian morality*.

The following stage of ethics is tied to the Greek-Roman culture. This stage concerns relations between individuals and society whereby society is understood as an indefinite group of known and unknown (or hypothetical) individuals and their properties and pertinence. The development of Roman right and of its well defined laws, and the actual developments of the concept of democracy, are a successive extension of the concept of ethics to society.

A codification of ethics which regularises the interaction between Man, Earth, Animals and Plants with whom we share the Earth, does not yet exist. The relations between Man and the natural world are strictly economic. Anthropocentric western ethics (or, better, morality) permit human rights over nature but do not account for any responsibility of Man to Nature.

The extension of ethics to this third element, i.e. the environment exploited by Man, and generally to the other living beings (plants and animals) is a conceptual progression as well as an ecological need. Such an extension is also required now by the development of biotechnology and by recently acquired knowledge of DNA chemistry.

Bioethics cannot be an individual prerogative or that of a single ideological group. *As a science, it has to find its roots in the logic of life on the basis of which it pretends to codify rules.*

The biological basis of ethics

A rational and naturalistic definition of Bioethics must, first of all, propose as an essential fact and as principal foundation *the conservation of species' DNA and the maintenance of its intraspecific variability*.

Indeed, this aim of promoting the DNA of the species and preserving its intraspecific variability is the basic principle of Bioethics.

The applicability of ethical norms to all biological entities whether they are species or preliminary forms of individuals (spores, gamete, embryos) or cloning products (cuttings), derives from this bioethical principle.

All these forms, even according to Hinduistic or Schweitzerian tradition, deserve respect and ethical consideration. However, the ethical consideration varies and they have a different weight according to the different biological complexity and its ontogenetic cycles (Tab 1).

A *first hierarchical level* of value must be attributed to the specific DNA of a biological entity characterised by a haploid order of genes such as a bacterium, a gamete, or a spore, or an haplophyte.

The *second hierarchical level* leading to complexity in the history of life are the diploid entities characterised by a diploid order of genes. They differ from the haploid because the fusion of the two haploid DNA filaments presupposes meiosis, which functions as a selective filter of casual mutations, the majority of which lead to the extinction of the haploid entity.

The ethical concern, however, is different if the diploid biological entity has no prospect of autonomous survival, as in the case of an embryo; if its reproductive cycle has already been completed; or if it is constituted by individuals whose existence is absolutely independent from specific DNA transmission as is the case in the subordinate classes of social insects or in the cutting.

a) In the case of animals embryo or of plants seeds, the contribution of these biological entities to the preservation of specific DNA and of its variability in the following generations has very few chances; their existence and their reaching of individuality, in fact, are conditioned by many heterogeneous environmental incidents. These incidents eliminate a large percentage of the biological entities, as happens with plants seeds, and fecundated eggs (embryos) in animals. This condition of uncertainty restricts the bioethical valuation of these biological entities.

b) In the case of entities which have completed their reproductive cycle, they are biologically useless and therefore their existence has lost biological significance, although they can have a bio-social significance in some species of animals. Their survival is mainly a surplus for the population.

c) In the case of social insects' subordinate classes, the meaning of their existence is limited only to their own life. In life's hierarchy these conditions are not considered as complete and their life is limited to their specialised differentiation and for a specific service in their biosocial community.

TAB.1 - Hierarchical order in the history of life and its ethical significance

| | |
|------------------|--|
| 1st level | Haploid (n): microorganisms, gametes, spores, haplophytes |
| 2nd level | <p>Diploid (2n): sexual reproduction (meiosis).</p> <p>In this 2nd level peculiar ethical concerns must be reserved to the biological entities as:</p> <p>a) <u>cutting</u>: they are identical copies of an original individual, ad they do not have variabilities, they are produced asexually. It regards mainly cultivated plants and lower animals, now also artificial cloning in animals and possibly man (nucleo-transfer).</p> <p>b) <u>subsidiary class of social insects</u>: they do not transmit the DNA of the species and they do not have reproductive potentialities.</p> <p>c) <u>early stages of life as embryos and seeds</u>: they have no certitude to reach the reproductive stage.</p> <p>d) <u>final stages</u> as hey have lost reproductive potential.</p> <p>Diploid Biological Entities: defines moreover the individual as unique, unrepeated and indivisible for its entire biological cycle.</p> |
| 3rd level | <p>Vertebrate animals in which the maintenance of the DNA variability typical of the species and its intraspecific variability is assured by socialisation defined by the interaction of internal and external factors (A. mother-offspring relation; B: sexual partner relation; C: cooperation in food research; D: cooperation in defence) and quantitative formula could be created to give the maximum and minimum number of individuals who could survive in a certain environment.</p> $(A+B) + K(C+D) = \Delta$ |
| 4th level | <p>Mankind in which the maintenance of the DNA typical of the species and its intraspecific variability is assured also by the product of the brain activities (history, traditions etc.). In this case Ethics can also become Moral Code ad the four types of socialisation input can be influenced by history.</p> |

The definition of Bioethics: "*Preservation of the DNA typical of the species and maintenance of its intraspecific variability*"

d) In plants and in lower animals, diploid biological entities exist like cutting. It is not possible to attribute to them the concept of individual since, although they are bearers of species specific DNA, they do not have any variability. They are all identical copies of subsequent fractionation without sexual reproduction. These entities lack individuality, they are identical copies, do not promote biodiversity and do not allow for the perpetuation of genetic variability of the species; they are living entities, but do not have the same characteristics as individuals.

We are instead interested in considering the ethical norms of those animal species in which the concept of “individual” is present; individual being defined as a biological entity characterised by “*uniqueness, indivisibility and unrepeatability*” for the entire ontogenetic cycle (i.e. individuals resulting from the fusion of gametes produced by the meiotic process of parental generation) and in which the germinal line is potentially active in all individual members of the population. This is the third hierarchical level in the history of life.

In these organisms the preservation of the characteristic DNA of the species and its intraspecific variability is guaranteed by precise rules of *socialisation*. Therefore, the ethical norms of these species are conditioned by the *biological stimulus of socialisation*. Socialisation thus means the stimuli needed to perpetuate the characteristic DNA of the species and its intraspecific variability. These stimuli are:

- a) parental care
- b) reproductive behaviour
- c) cooperation for food acquisition
- d) cooperation for individual or group defence.

These stimuli are the target of ethical rules governing the social organisation of Vertebrates, Man included.

These four factors, independently one another, are the entities upon which are developed the ethical norms of the third hierarchical level in the natural system.

They could also be organised in a sort of equation. In fact, while A and B are strictly dependent on the species' biology, C and D are related to environmental conditions. It is thus necessary to introduce for both of these last two elements a constant k which is linked to environmental conditions in which the species or the population happens to live.

These four factors may be quantified in terms of consumptions of necessary energy (*calories*) and amount of time invested (*time*) in the fulfilment of the ethical imperative of the reproductive process. This allows one to arrange them in an equation whose result ought to give the minimum and maximum size (Δ) of the population of a given species that can survive in a certain territory.

$$(A+B) +k(C+D) = \Delta$$

From a genetic point of view, this delta could be identified with the concept of *Deme*. The *Deme*, in a local panmictic population, determines the minimum number of individual needed to guarantee genetic variability, which is essential for its subsistence for an unlimited number of generations.

In this definition of deme the essential presence of genetic variability is stressed. In order to keep constant the frequency of genes in a population, four conditions are necessary: 1) absence of selection, 2) panmixia, 3) absence of mutations, 4) absence of differential migrations. The minimum number of individuals in a population must therefore take into consideration these four factors.

The maximum number of the individuals of a population in a given territory, depends on the carrying capacities of the territory, i.e. the k which relates the food requirement and the defence investment of the population to the specific biology of the species considered. It follows also that the interaction between the biological characteristics of a species and the productivity of the territory in which it lives determines the sociological characteristics of that species. The recent developments of animal ethology fully demonstrate this.

From this sort of equation, which may be applied to all vertebrate species (Mammals in particular), it is possible to derive one that is more specifically suited to Man. This formula contemplates, in fact, his cultural development, which can be generally indicated with an exponential function of human intelligence (e^i). For Mankind the formula will be written as such:

$$[(A+B) + k(C+D)] e^i = \Delta$$

This socio-intellectual control on the environment in the natural system can represent the quality leading to the fourth hierarchical level of ethical norms.

Also in this case is the minimum and maximum limits of Δ (H), (the numbers of individuals utilising a certain territory) that impose the ethical norms of behaviour for our species. For this reason the minimum or maximum number of individuals that constitute the deme may vary according to different environments in which various human populations live in the different historical contexts.

The interaction between the four ethical drives of socialisation and behavioural rules shows an interesting link with the trine interpretation of brain suggested by Mc Lean (Chiarelli, 1955). The behaviour and the stimuli of socialisation indicated by C and D are mainly centred in the paleomammalian brain (limbic brain). Both these brain stratifications suffer the inhibitory, corrective and stimulative action of the neomammalian cortex. For instance, the knowledge acquired through imprinting can be controlled, as can that imposed by induced habits, usual behaviour, social and political conformism, behaviour and knowledge with their main seat in the reptilian brain. Analogical, critical and casual thinking is what distinguishes the neomammalian cortex, especially the human one.

In other words, and in general for humans, it is the interaction between the biosocial and intellectual characteristics of the population and the productivity of the territory in which they live, that contributes to determine the ethical norms characterising the historicised behaviour of the different human populations.

As in animal populations, the interaction between the environment and the human exploitation produces the rules which characterise historical behaviour (*tradition, customs, morality*). They facilitate human survival and cohabitation. After all, even the Christian commandments, from the fourth section on, are rules which codify the four fundamental stimuli of social interaction.

The adaptive choices of human social structure and the ethical choices of Mankind (even biotechnological and biomedical) must account for the interaction between human populations and the environments in which they live. They must be, moreover, independent from the influence of religious and political leaders whose ideologies of power do not respect this equilibrium. The achievement and maintenance of such an equilibrium is fundamental to the survival of our species.

Nature, in fact, might not be interested in human survival. Modern Man, *Homo sapiens*, as all other animal species, are products of the same evolution. Similar to other species in the past, humanity is now involved in an unorganised exploitation of available resources. Humans are now capable not only of self-destruction, but also of the destruction of plant and animal species which share the same environment. It is important to note, however, that humanity, on a geological timescale, represents but a few microseconds in the over 4 billion year history of life on Earth.

Bioethics, therefore, must be understood both as a biological and a naturalistic science relevant to anthropology and ecology.

Its presence in medical faculties is only a nominal mistake. Medical faculties should be responsible for the development of "Medical Ethics" which have to resolve the problem caused by the recent expansion of biotechnology to physicians' professional deontology. Real bioethics issues are different. To clarify this distinction, we, along with Van Potter, have proposed the term "Global Bioethics". In addition, we have founded a journal with this title (*Global Bioethics*) and I published a book with the same title (Chiarelli 1993).

The historically related bioethical behaviour of humans can be linked to Morality which can assume different norms in different historical contexts. Morality could be therefore governed by religions or be normalised by governments. Ethics is instead a pure biological and ecological discipline. Man with industry and technology, the product of his intellectual abilities, can now expand the resources of a given territory.

The adaptative choice of the human social structure and the ethical choices must depend on the interaction between human population and natural environment in which they live. This equilibrium must be maintained or sought after for the very survival of our species.

From bioethics to global bioethics

The moral and the adaptative choices of the human social structure, including biotechnological and biomedical ones, must be consistent, in this formulation, with the interaction between human populations and their environment (traditions). Moreover they must be unrelated to the influence of religious or political leaders, since their ideologies aim at power and disregard the balance with Nature, a balance to be kept and improved for the survival of our own species.

In fact, Nature may be uninterested in human survival. Humankind is a product of evolution as are the other species. However, just like these other species, if Man misuses his reproductive capacity and overexploits natural resources, he can destroy both himself and other species.

Time is running short. According to demographic forecasts, in 2025 the Earth's population will be 10 billion. If this population, as is desirable, is granted Western-style living conditions, this will be catastrophic and the human species is likely not to survive.

Global Bioethics, as a proposed new discipline aims at an agreement between Man and Nature in order to assure human survival on Earth. This is a complex but useful challenge that must be contested and won in a very short time. This is why Van Potter and I established the journal "Global Bioethics" and I wrote the book "*Bioetica globale*", establishing a naturalistic and anthropological distinction of "bioethics" from moral philosophy, medical deontology and environmental ethics.

This distinction between ethics and moral philosophy claims to discuss the problem of choice between good and bad, or between what is allowed and what is forbidden. It aims at doing this rationally and by refusing the influence of a humanistic culture. The issue of "ethical anthropocentrism" is linked to this new way of organising daily life as well as to our next choices, so that the survival of our species can be assured.

Global Bioethics rejects the short-sighted concepts of traditional humanistic philosophy. The often self-destructive moral precepts that still dominate so much of contemporary ethical debate reflect a narrow "ethical anthropocentrism" that fails to recognize the fact that Mankind is dependent from the biosphere, and that the biosphere has strict limits. Many precepts of modern humanistic ethics are challenged by bioethics, which judges them against the need to ensure the survival of our all other species. If Mankind misuse its technology not only to promote dysgenic reproduction, but also to allow its reproductive capacity to overexploit its natural resources, it can destroy not only its own species, but also most of the other higher species with which it currently shares its strictly limited global habitat.