J. Biol. Res. 2006 n. I - Vol. LXXXI - Rubbettino - Soveria Mannelli

A suggested distinction between ethics and morality

B. Chiarelli

Department of Animal Biology and Genetics "Leo Pardi",
Laboratory of Anthropology, University of Florence

KEY WORDS: biological basis of ethics

Abstract

The biological basis of ethics is here proposed with a hierarchical progress of 4 livels from bacteria to humans based on the complexity of the organization of the DNA and its interaction with the environment.

A rational and naturalistic definition of ethical norms must first of all stipulate the preservation of the DNA typical of the species and the maintenance of its intraspecific variability. Indeed, this aim of preserving 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, gametes, embryos) or products of cloning (cuttings), derives from this bioethical principle.
1. All these forms, also according to the Hindu and the Schweitzerian traditions, are worthy of respect and of ethical consideration. However, the ethical consideration varies and has a different weight according to different biological complexity and its ontogenetic cycle.
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 those of a bacterium, a gamete, a spore or a haplophyte. They differ from the biological entity characterised by a diploid order of genes. 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.
2. The diploid entities represent therefore a second hierarchical level leading to complexity in the history of life, which deserve merit in themselves.
But the ethical concern is different if the diploid biological entity has no prospect of autonomous survival, as in the case of an embryo, or if its reproductive cycle has already been completed or if it is made up by individuals whose existence is thoroughly independent of the transmission of the specific DNA as in subordinate classes of social insects or in the cutting.

a) In the first case (the embryo) the contribution of the biological entities to the preservation of the specific DNA and of its variability in the following generations has very few chances, because their existence and their reaching the level of individuals are conditioned by many heterogeneous environmental incidents which eliminate most of them, as happens for seeds in plants and fertilized eggs (embryos) in animals. This situation of uncertain perspective restrains bioethical evaluation.
b) In the case of the entities having completed their reproductive cycle, these 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 third case, the subordinate classes of social insects, their existential meaning is limited to their mere existence. In life hierarchy these conditions are not considered as complete and their life is limited to their specialized differentiation and for a specific service in their biological community.
d) In plants and in lower animals there are diploid biological entities, like cuttings, to which it is not possible to attribute the concept of individual, since although they carry the species specific DNA, they do not have any variability. They are all identical copies of subsequent fractionation without sexual reproduction. These entities lack individuality and do not allow the perpetuation of the genetic variability of the species; they are living entities, but do not have the same characteristics as individuals.
3. 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. unrepeatabily, 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. This is the third hierarchical level of complexity in the history of life.
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. Therefore the ethical norms of these species are conditioned by the biological stimuli of socialisation.

Socialisation thus means the stimuli which serve to perpetuate the characteristic DNA of the species and its intraspecific variability. These stimuli are: A. parental care B. reproductive behaviour C. co-operation in the search for food D. co-operation in defence of the group These stimuli are the target of ethical rules governing the social organisation of Vertebrates, Man included. They could also be quantified.

While A and B are strictly dependent on the biology of the species, C and D are related to environmental conditions. It is thus necessary to introduce for both these last two factors a constant, k, related to the environmental conditions in which the species or the population happens to live. So, these four factors, independently of one another, are the entities upon which are developed the ethical norms of the third hierarchical level in the natural system. These four factors may be quantified in terms of consumption 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 (delta) of the population of a given species that can survive in a certain area.

(A+B) + k(C+D)= delta

From a genetically point of view, this delta identifies the concept of Deme which in a local panmictic population determines the minimum number of individuals 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, beside depending on the supporting capacities of the territory should also take into account the conditions mentioned above, therefore, a population could not be made up of individuals of one sex only and should include individuals of different ages.

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

[(A+B) + k(C+D)] ei = delta

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

Also in this case is the minimum and maximum limits of delta(H), where delta(H) represents 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. In other words, it is the interaction between the biological characteristics of the species and the productivity of the territory (even if, in the case of Man, this may be increased by the intellectual ability of the human brain), that contributes to determine the ethical norms that characterise the historicized behaviour of the different human populations.

This human and historically limited behaviour can be related to Morality which can assume different norms in different historical contexts.

The adaptive choice of the human social structure and the ethical choices (including biotechnological and biomedical ones) must depend on this 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.

References

Chiarelli B. 1977. A new view of ethics: the bioethics proceedings of discoveries. In B.M. Adkins (ed.), Discoveries, 5-18, Tokyo: Honda Foundation.

Chiarelli B, Gadler E. 1989. Nota storica: Van Resselaer Potter e la nascita della bioetica, "Problemi di Bioetica" 5: 61-63.

Chiarelli B. 1992. Man, nature and ethics. "Global Bioethics" 5: 13-20.

Potter VRL. 1971. Bioethics: bridge to the future. Englewood Cliffs: Prestige Hall.

Potter VRL. 1992. Global bioethics facing a world in crisis." Global Bioethics" 5: 69-76.

Watson J. 1988. Livelli di conoscenza e stadi di coscienza. Alcune riflessioni sulla bioetica. "Problemi di Bioetica" 1: 25-42.

Wilson EO. 1978. On the human nature. Cambridge, Mass: Harward University Press.