

Bio-Ethics

Introduction

Bio-ethics provides the ethical and philosophical foundations for the concept of peaceful and harmonious co-evolution of humanity and bio-environment. This concept implies a global vision of "the Universe, the Earth, and all living beings. Each has his own voice, its role, its power over the whole."¹

Bio-ethics is an essential part of modern biopolitics. Biopolitics in general is aimed at maintaining and promoting life, bios.²⁻⁴ Bio-ethics is primarily concerned with the ethical issues pertaining to all forms of life. In this way, bio-ethics supplements bio-legislation,⁵ the field of biopolitics dealing with the legal problems associated with bios. In many instances, bio-ethics and bio-legislation should be used in concert. For example, genetic engineering has raised issues with both legal and ethical dimensions.

Bio-ethics can be considered both a conceptual science with a philosophical dimension and, at the same time, a direction of practical activities. From a philosophical perspective, bio-ethics is closely related to the principle of reverence for life. Of paramount importance for bio-ethics is the philosophical idea that any individual, any form of bios is of unique, absolute value. The underlying philosophical idea of intrinsic unity of human and non-human life entails the responsibility of humans for all bios. The development of bio-ethics calls for overcoming the following attitudes towards bios which are outdated:⁶

- the technical attitude regarding living things only as useful tools;
- the reductionist attitude towards life denying the principal difference between living beings and non-living matter.

Behavioural researchers have shown that animals are able to learn, to communicate in a complicated way, to make choices, to map the area around them, and to generate new ideas (insight). A number of leading researchers are inclined to attribute elements of consciousness to the higher animals.

Biologists are inclined to avoid using the term instinct in dealing with animal behaviour. The instinct concept only seemingly explains why, e.g. a bee builds its honey-combs in geometrically regular fashion. As we know now, even the lower invertebrates combine in their behaviour 'inborn' and acquired reactions in very complex way. The honey-comb building bee, actually, does not always use one and the same genetically programmed pattern in its work, it has to choose among several options. This choice may represent an instance of conditional, learned and even insight-related behaviour. Instead of being preoccupied with genetically prescribed behavioural patterns only (although these do really exist), biologists nowadays tend to consider the more loose term open instincts.

This means that only the general strategy, e.g. nurturing the young or defending territory may be genetically fixed, whereas the tactical details may vary, depending on the situation and previous learning. In this loose meaning, the notion open instinct applies even to man, because we, too, have naturally-determined general behavioural patterns: we defend the territory, form families, nurture the offspring.

Recent research with animals has revealed that the animal life is not confined only to struggle for existence and natural selection, although this plays an important part in the animal kingdom, as well as in all the other kingdoms of life. Bios is also characterized by mutual aid and cooperation, a very powerful factor of progressive evolution.⁷ The feeling of oneness of bios penetrates the new ethical movements and initiatives which have recently taken shape throughout the world.

Bio-Environmental Ethics

The pressing problem of our time concerns the fate of the bio-environment, of bios endangered by human activities. This problem includes an ethical dimension. A human being is closely related to, and dependent on, all the life on Earth. How, then, can we reconcile our existence with the rapid deterioration of bios, as illustrated by the following examples:^{2,3,8,9}

- 200 elephants are being killed every day;
- 25,000 to 50,000 square kilometers of Brazilian rainforest are destroyed every year;
- in different parts of the world, exotic animals are trapped for sale;
- desertification caused the loss of 7% of the arable land in the world during the 80s;
- dioxins, extremely toxic compounds, have accumulated in the Baltic fish to such an extent that they are detected in the blood plasma of fish-eating people.

These examples demonstrate that economic interests and health problems are interrelated with bio-ethical issues. In view of the critical situation in the world, urgent measures have recently been taken. But what is required is a major attitudinal change concerning business and economic matters.¹⁰⁻¹⁸ According to the instruction of the Council of the European Community of June, 27, 1985, the best environmental policy is to prevent pollution rather than to remove its deleterious effects.¹⁰ In this context, the term environmental ethics can be used. For instance, a Code of Environmental Ethics for Engineers has been developed by the World Federation of Engineering Organizations. This code emphasizes minimization of raw material and energy consumption and pollution.¹⁸ Top priority must be given to the following attitudinal changes:¹¹⁻²⁰

Present attitude	Recommended attitude
Choice between alternatives: <i>either</i> economic development, <i>or</i> environmental protection	Promotion of <i>both</i> the economic progress <i>and</i> the bio-environment
Focus on short-term results and corporate profits	Focus on long-term effects in terms of social welfare <i>and</i> bios enhancement
Pollution control	Pollution prevention, waste - free economy, recycling
Economic growth depends on use of environmentally relevant inputs, ¹² whose use stirs up the pollution threat	Research is made in order to disconnect economic growth from non-renewable resources with the aid of biotechnology

In order to achieve the attitudinal changes desired, a number of practical steps including levying taxes on the polluters, introducing waste reduction policy¹¹ and using representative polluting substances as indicators of pollution, have been designed. Important initiatives pertaining to environmental ethics have been recently launched.

Environmental ethics can be seen as a multidimensional value system. The following concepts are of particular importance for environmentally-friendly business:²⁰

- quality: a product cannot be considered to be high quality unless produced in an environmentally acceptable manner-on a global scale, it does not suffice that bio-environment is protected in the producing countries. Bios in the Third World countries providing raw materials is to be reckoned with;
- creativity: work in industry can become more creative if the physiological well-being of the employees is promoted by improving the work conditions on the basis of the recent data of human psychology;
- humanity: production activities can be considered humane if the needs of all the forms of bios are taken into account;
- civic responsibility: it should become a citizen's duty to promote the bio-environment in his own country;
- environmental image: concern about the preservation of bio-environment is to be considered a prerequisite for a good reputation of an enterprise in the world market. Bio-ethics is thus supported by commercial incentives.

The application of these new bio-environmental values is further discussed in the bio-business and bio-legislation sub-sections of this syllabus

Bios Rights as Related to Bio-Ethics

The central idea of bio-ethics regarded as a component part of biopolitics is the concept of bios rights.²⁻⁴ As further developed in the section on bio-legislation, bios rights may be divided into:

- the human rights which acquire new dimensions if considered in the context of the bio- environmental issues. The diverse forms of bios on Earth are important not only in themselves, but also constitute the bio-environment which is essential for the existence and development of humanity. Thus, the task of maintaining and promoting the bio-environment acquires a bio-ethical dimension (see the section on Environmental Ethics);
- the animal rights, subject of the next section of this text;

the plant rights which combine in them both the aesthetic and the pragmatic aspect.

- the microbial rights which are currently gaining in importance with the development of biotechnology.

Several groups have been formed to deal with questions involving legal dimensions and bio-ethics. For example, the Milazzo Group on bio-ethics was set up in 1989 under the auspices of the Institut International d'Etudes Ethico-Juridiques sur la Nouvelle Biologie (ISENB). Designed on the analogy of the famous future-forecasting Roman Club, this group includes about fifteen prominent scientists, lawyers, psychologists and sociologists. Devoted to the problems of bio-ethics, the Milazzo Group realizes goals such as unbiased and unprejudiced discussion and exchange of views on bioethical issues. Science ethics and legislative policies involved in it are the focus of the newly established Association Internationale de Droit, Ethique et Science.

In terms of the rights of bios stipulated above, the major ethical issues pertaining to experimentation on animals, infertility treatment, genetic therapy and environmental policy will be briefly evaluated below.

Animal Research and Bio-Ethics

Progress in the biological sciences throughout their history depended in considerable part on the data obtained in studies with animals. Aristotle dissected animals, in particular, pigs and monkeys as he was interested in anatomy. A number of animal species received particular attention of the scientists who found these animals especially convenient for their studies. In many instances, the crucial consideration in choosing the experimental object was its similarity to, and evolutionary relationship with, the human being. In all these respects, mice, rats, rabbits, guinea pigs, cats, dogs, and in some cases monkeys were considered as preferable research objects.

However, issues concerning animal experimentation still remain a pressing problem. This can be exemplified by the results of a recent seminar on alternatives to animal experimentation in pharmacology (Charleroi, February 1991).²⁴ It was strongly suggested that a scientist should search for alternatives not involving animals. However, during the conference it became clear that the following points need clarification:

- should the notion of animal rights be confined to mammals, or should it extend to all vertebrates, insects, worms and protozoans?
- should the use of animals for purposes other than scientific research be on the agenda of a discussion on bio-ethics?
- should we draw a distinction between pharmacological and bio-medical studies where animals appear indispensable for testing medicines (DL50, the dose causing death of half of the animals tested, is needed to commercialize any new medicine) and fundamental research where alternatives may be available?

These issues are currently being considered in various nations all over the world. There is growing opposition against extensive use of animals in zoos and circuses, as well as a trend of thought favoring the vegetarian diet. Ethical issues concerning traffic in exotic animals from Asia, Africa, Australia, Latin America have been raised.²⁵

Recent research on animal behaviour and psychology has exacerbated the bio-ethical issues. Especially in studies with dolphins, it is not uncommon that the animals take over the initiative in the experiment, playing the part of the researcher and reducing the scientist to a mere 'test object'. Reconsideration of the research strategy of biologists vis-a-vis the animals is thus in order.

Human Embryo/Fetus: Bioethical Implications

There is a strong tendency in modern society towards attributing bios rights to a developing human being from the early embryonic stages.

Historically, the status of the embryo was the center of major controversy. In ancient Greece, the Stoic philosophers denied that an embryo/fetus represented an entity independent of the mother's organism. They associated the beginning of a new human life with the first breath of a newborn child.²⁶ At the same time, the Platonic school of philosophy regarded an embryo as possessing ontological autonomy. The latter view was then supported by the Christians, in particular by Tertullian, who therefore considered abortion an instance of homicide, because a man-to-be was also a man. ²⁶ In the Byzantine Canon law, a developing embryo acquired the status of a being endowed with rights. The philosophers of that time argued that the reasonable soul entered the embryo on the 40th or 80th day after conception, depending on the sex. ²⁶

The status of an embryo/fetus is still at issue nowadays. The embryonic development consists of a number of stages, including the following:

- the fertilized ovum;
- the embryo before implantation into the uterus;
- the implanted embryo;
- the embryo which has acquired human species-specific features, a fetus;

- the fetus immediately before birth.

Under consideration are the rights of the developing individual at all the stages. A well-grounded attitude towards the embryo consists in attributing to it the status of a prospective, future human being. 27 In this case, an embryo is legally protected like any human being if it is dealt with for the purpose of producing a child.

These ethical issues involve the use of embryonic/fetal tissue for treatment of a number of diseases or for research or other purposes. It is known that fetal tissue can be used in treatment of Parkinson's and Alzheimer's disease, sickle cell anemia and diabetes. 3,28 A special concern is the commercialization of embryonic materials which has already caused women in less developed countries to sell their fetus. As an example, according to the Act 42/1988 of the King of Spain, Juan Carlos I, the use of fetal/embryonic material²⁸ for purposes other than medical treatment and diagnostics or scientific research relevant to health care is to be considered by the legislative bodies. It is in their field of competence to decide whether or not to authorize a research project involving a fetus or embryo.

The attitude towards abortion depends on the status attributed to the embryo. In the contemporary world it is still a widespread practice. As estimated in 1990, 1.5 to 1.6 million abortions had been carried out annually in the U.S.A. 8 alone. Legislation on this matter differs from country to country. Despite re-unification of Germany, abortion is still permitted in the East and prohibited and prosecuted in the West. However, even staunch adherents of the idea of banning abortion cannot ignore the following issues:

- should abortion be recommended in cases where lethal diseases³, serious handicaps such as Downs syndrome²⁹ or incurable lesions²⁷ are found? Currently, abortion is practiced in these cases. The introduction of genetic diagnostics will considerably exacerbate this problem (see below);
- should abortion be permitted if the child is an undesired one and/or no proper conditions for nurturing it can be created; in Romania, prohibition of abortion resulted in the emergence of a whole generation of children deprived of proper care;

The abortion issue becomes still more complex if we consider its effects on the woman's organism. Not the rights of the embryo, but the concern for the woman's health was until recently the main reason for a doctor to dissuade a woman from resorting to abortion.

Another controversial point is whether or not it is legally permissible to store human embryos using cryoconservation. This problem arises if fertilization of an ovum is carried out in vitro. Should the embryos produced 'in excess' of demand be cryopreserved? 27

Considering cryoconservation leads to the discussion of the bio-ethical issues of artificial insemination and fertilization, the modern techniques involving both embryo-right problems and the issues pertaining to the other agents involved.

Bio-ethics in Relation to Artificial Insemination and Fertilization

There is a general tendency towards decrease of the number of sperms in human semen observed since the 1950's. Changes in the environments, food habits, dress style and the rhythm of life may account for it. 30 This unfavorable tendency manifests itself in the increasing incidence of male infertility, although the females may also be infertile. This condition calls for medical treatment, the following methods of which are currently in use or under development:

- administering medicines, in particular hormones;
- ameliorating in vitro the quality of the sperm: selecting sperm with desirable properties-mobility, genotype-by means of centrifugation, glass fiber filtration, gel separation, simulating the activating effect of the uterus by adding stimulating substances to the sperm in vitro; subsequently, the selected sperm is introduced either into the uterus-Intra Uterine Insemination, IUI-or into the lower part of the abdominal cavity-Direct Abdominal Insemination;
- fertilizing an ovum in vitro (Fivete). At the laboratory stage of development are modifications of this method, such as introduction of a sperm into the cytoplasm or perivitelline space of the ovum. 30

The artificial insemination technique has been successfully employed for several decades. It was introduced in Belgium 25 years ago, using either the sperm of the husband of the patient, or that of a donor. More recently, methods have been employed which involve donated ova or embryos which have yielded encouraging, although still limited results. 27

The ethical implications of these scientific innovations are complex. These developments give hope to people desiring to have children, preventing them from feeling frustrated. Generally speaking, none of the techniques considered should be rejected a priori, although each situation that arises has to be carefully analyzed.

As the methods considered involve much scientific knowledge, their application can cause lay people to feel abashed and may result in misunderstanding. In this case, the help of specific institutions such as family planning centers, is to be sought. It is expected that their personnel can cope with the client's problems at a high scientific level.

The following bio-ethical guidelines can be drawn to assist all those involved with insemination or fertilization in vitro^{27,31}

- the independence and right of free choice of every human being are to be safeguarded. In forming their choice, people are to be consulted, correctly informed and assisted by the family planning center members, which, however, should not make decisions on their behalf;
- as the above techniques involve a number of people-the future child, the potential parents, the sperm/ovum donor, the assisting personnel, the doctor-the interests of all of them are to be duly considered;
- emphasis should also be placed on the child's future. Therefore, the ability of the potential parents to satisfy the material and spiritual needs of the child, to ensure its harmonious development is to be striven for.
- should a donor sex cell be used, the donor is to remain anonymous, the biological truth being of no importance;
- the benefits of artificial insemination/fertilization should outweigh the potential medical and psychological risks: this is prerequisite for carrying out the above procedures. ²⁷

According to the bio-ethical guidelines drawn up by Professor Massarenti from Geneva, the following principles are to be introduced: ³¹

- non-generalization: each problem is to be regarded from different points of view;
- non-identification: as things and people are more complicated than any system of categories, it is recommended to avoid classifying them into categories unless necessary;
- self-reflection: one should assume conscious control over one's impulses.

The part to be played by the members of family planning centers is to ask the people rather than to make decisions for them.

These principles also apply to the other issues under consideration, namely the ethical issues pertaining to artificial insemination/fertilization.

Death and Euthanasia

The progress of science has changed our attitude towards death. Whereas in the past death was considered to entail loss of all vital functions, respiration, heart beating, and so forth-nowadays a human may be regarded as dead with beating heart and respiration aided by an apparatus.

This is the so-called brain death. If the brain of an individual has been established to be dead, the organs and tissues of his body may be used for the benefit of those needing them. Whereas the legal problems associated with the condition of brain death have been, for the most, part overcome with the enactment of detailed regulations on it, the bio-ethical issues still remain, especially if religious concepts are implicated. In addition, especially in the case of a cerebral trauma, it may be extremely difficult, if at all possible, to unequivocally establish that the loss of brain activity is irreversible. What if some insignificant electrical activity is registered?

More recently, the notion of neocortical death has been introduced. This entails the chronic vegetative state: complete unconsciousness with retained physiological functions and open eyes. In some instances, no doctor can predict the final result. After many months spent in the state described, people occasionally regain consciousness, which suggests that neocortical death may be an erroneous diagnosis.

In the condition of akinetic mutism, only the frontal region of the brain is impaired. A patient spends his time lying with open eyes and seems to contemplate all the objects around him with extremely vivid interest. However, no contact can be established with him. Account should be also taken of:

- the state of lethargy sleep which may last over a decade;
- the condition of total paralysis of the extremities and the muscles involved in speech, with retained consciousness; in this condition, only mastering the eye movement language can enable the patient to come into contact with others;

The ethical status of all these situations remains unclear. These problems are considered in depth in the book edited by W. Demeester De Meyer²⁷ involving euthanasia-related issues. The authors draw a distinction between:

- assistance to the dying person: relieving his sufferings through administering pain-mitigating medicines, and altering the consciousness of the person;
- orthothanasia: letting the incurably diseased person "die his own death" while making no extra efforts to prolong his life;
- passive euthanasia: refraining of any medical treatment aimed at retarding death.
- active euthanasia: terminating a person's life in a painless way, at his request and with the intention to prevent the person from suffering;
- assistance to a suicide: helping a person take his own life.

These problems have recently caused special concern due to a high incidence of severe diseases such as cancer or perturbations of cerebral blood circulation which lead to an incurable, irreversible state associated with prolonged periods of suffering. However, the intertwining legal and bio-ethical problems remain a matter of controversy. Euthanasia is considered equivalent to murder in the legislation of a number of countries such as France. 27 At the same time, French legislation does not regard assistance in suicide as punishable. 27 A law draft recently suggested by the Criminal Law Revision Committee in the U.K. permits passive euthanasia by interrupting medical treatment, as in the case of irreversible coma. The English law, however, makes no distinction between assisted suicide and murder. These differences in legislations highlight the complexity of the bioethical problems still awaiting solution.

Human Organs and Tissues in Terms of Bio-Ethics

The progress in cell and tissue cultivation has raised the ethico-judicial issue concerning the ownership of the tissues/cells maintained in vitro. Are they the property of the donor or of those engaged in cultivating them? We have already touched upon this question in its especially complicated variant: when the tissue belongs to a fetus. A similarly complex issue arises when a newborn baby is the donor of blood cells vitally needed by another individual.

The property issues are closely related to the issue of the legitimacy (or otherwise) of trade in human organs and tissues. Reportedly, British hospitals were buying kidneys at a price of 2,500 to 3,360 pounds per organ. 8 The predominant trend of thought, currently, is to put a ban on human organ and tissue commercialization. However, alternatives to distributing parts of the human body through their commercialization have not yet been sufficiently developed.

A kidney donor is left with a single kidney after the transplantation. Whether he is attracted by the financial reward offered by kidney donation, or desires to save his relative's life, the moral and legal duty of the doctor is to properly inform the volunteer of the possible risks associated with organ donation. For example, a young girl saving her sister by kidney donation³² risks facing serious problems when becoming pregnant.

The other vital human organs currently transplanted, the heart, liver and pancreas, are not present in duplicate, as contrasted with the kidneys. The ensuing bio-ethical issue is that a person included into a waiting-list for organ transplantation is actually waiting for another person to die. This donor should preferably be a healthy young person, whose sudden death is usually due to an accident. One issue with both legal and ethical dimension involves the rights of the family members vis-a-vis transplantation of the organs of the deceased. Do they have the right to decide, whether or not to use the organs of their relative? These serious ethical questions are, to a great extent, removed if the donor's consent for organ transplantation has been previously given. By consenting in advance to the use of the organs for the benefit of others, a person makes an extremely important bio-ethical decision, as he is ready to help the others realize their right to live.

Objectives

- to develop the ethical and philosophical foundations for harmonious co-evolution of humanity and bio-environment;
- to evoke ethical responsibility towards bios rights;
- to increase the understanding of interdependence between all forms of life;
- to elucidate the moral issues arising from the applications of modern bio-technology;
- to sensitize the public on the need to anticipate the future ethical dilemmas caused by technological progress.

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