

be able to unravel the tangled web that derives from experiments on the human body. And give man tranquillity about his destiny.

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БІОЕТИЧНА КУЛЬТУРА

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Багато зроблено в сфері генетики: стало можливим розглядати ген людини, копіювати його, комбінувати тощо, але мине час, і він стане більш «домашнім», тобто людина зможе сама керувати ним і здобувати від нього користь.

Мета і завдання біоетики — зробити можливим співіснування наукового і технічного прогресу з життям, розв'язати проблеми, які виникають між суспільством та індивідумом, природою і технічним обладнанням. Біоетика є сполучною ланкою між цими двома світами і, що найважливіше, допомагає запобігти насильству над природою і людиною. Згідно з її постулатами, необхідно враховувати інтереси обох сторін, як з точки зору економіки, науки і техніки, так і з боку навколишнього світу, природи; необхідно прийти до такого стану, коли вони почнуть діяти гармонічно. Сюди ж включаються й інтереси людини, яка нерозривно пов'язана з усіма сферами життя.

Ключові слова: біоетика, навколишнє середовище, технічний прогрес.

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БИОЭТИЧЕСКАЯ КУЛЬТУРА

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Многое сделано в области генетики: стало возможным рассматривать ген человека, копировать его, комбинировать и многое другое, но пройдет время, и он станет более «домашним», т. е. человек сможет сам управлять им и извлекать из него пользу.

Цель и задача биоэтики — сделать возможным сосуществование научного и технического прогресса с жизнью, разрешить проблемы, возникающие между обществом и индивидумом, природой и техническим оборудованием. Биоэтика является связующим звеном между этими двумя мирами и, что самое важное, помогает предотвратить насилие над природой и человеком. Согласно ее постулатам, необходимо учитывать интересы обеих сторон, как с точки зрения экономики, науки и техники, так и со стороны окружающего мира, природы; необходимо прийти к такому состоянию, когда они начнут действовать гармонично. Сюда же включаются и интересы человека, который неразрывно связан со всеми сферами жизни.

Ключевые слова: биоэтика, окружающая среда, технический прогресс.

Biotechnologies

We are entering the XXI century with an exceptional baggage of knowledge, techniques, products, applications and research lines related to biotechnology.

"Modern biotechnology" is gradually taking shape at a very fast pace ever since Watson and

Crick first described the double helix structure of DNA in 1953 and the genetic dogma "one gene equals one protein" (now reviewed) was formulated. Twenty five years ago advances in molecular biology gave way to the "New Genetics" (Nathans) and set the scenario in a more significant context, in particular advances in genetic or molecu-

lar engineering, that is, "the recombination of genes or gene sequences of different origin". In the late 70s molecular techniques using restriction enzymes and ligases were developed: with the former DNA can be cut into smaller parts and with the latter those parts can be "glued" to other genes or gene segments. In the 80s the development of vectors (viruses and plasmids) to which DNA segments can be integrated and transported was achieved. A decisive step in the progression of events were Craig Venter and Francis Collins announcement of their achievements in the mapping of the human genome (on 26.06.00 and on 12.02.01). Such an advance was presented as the panacea against human disease and as eventual facilitator to extend human life, which is obviously not a priority for the time being.

But from now on, and after the sequencing of the human genome, other possibilities are added to those aforementioned. However, it is only reasonable not to harbour great expectations as there is a long way to go before we actually get to know the location and function of each individual gene in the human genome (genetic map), gene interactions (functional map), the relation of genes and the nearly 10.000 proteins (proteomics) and gene expressions in the living organisms as well as their effects (individual and population mappings, normal or pathological nature). Needless to say, that is not as straightforward as it may seem.

No one can doubt the range of possibilities that are offered to research, preventive medicine, to the diagnostics of serious diseases and frequently presenting conditions, selective therapies, the production of cells, tissues and maybe complete organs (as from stem cells) that can be used for auto-transplant purposes risk-free of immunological rejection, regenerative therapies, etc., and also to the availability of genetically modified foodstuffs of greater quality, to the protection of ecosystems and to biodiversity. Some of these are developments already underway whilst others open the door to very attractive expectations (we could mention the doing away with the theory of genetic racism or superiority). Nevertheless, the ethical implications underlying some of those applications need be considered.

On the other side of the coin, however, the terrible problems inflicted upon humankind by humankind in the past century are persistent and even enlarged. The dramatic and shameful manifestations of psychological and physical brutality are more often than not related to an inhuman use of science and technology, adopting the most hideous and subtle ways: wars, nuclear trials, genocide, crimes against humanity, famine, lack of drinkable water, lack of elementary health care, avoidable diseases, woman and child abuse — marginality, forced orphanage, sexual exploitation, labor market exploitation, criminal organ

retrieval and selling, psychophysical destruction, manipulation, mutilations, non consented to experimentation; an increasing abandonment of rural areas, massive inner and outer emigration of populations (there are 100 million of economic emigrants — 1.8 % of the population of the world — and 18 million refugees for political reasons); a progressive urbancentrism and the subsequent configuration of megapolis enclosing peri-urban settlements or ghettos of infrahuman conditions; extermination of indigenous populations; racism; xenophobia, etc.; degradation of the Biosphere; aggression to biodiversity; extinction of some species and so on and so forth.

The dual social reaction (perplexity and pride at what Man can do) towards morally and intellectually provocative facts such as the ones resulting from the application of some biotechnologies (genetic manipulation, cell fusion and cloning) is frequently accompanied by uncertainty about who will really benefit from so much progress and about whether or not mechanisms of control over the potential risks of such applications will be implemented at all. The risks are namely those related to:

1) Direct harm to the human being (rights, health, evolution of the species).

— *to intimacy and privacy (collection and filing of data).

— *to health: causation of disease (tumors, infectious diseases, etc.); resistance to antibiotics (betalactamics, ampiciline); mutation: a) unintentionally caused; b) sought (racial selection, the production of warrior, the production of obedient individuals; speciation?).

2) The discriminatory utilisation so that.

— advances will help only a privileged few who can pay for them which will no doubt, contribute to enlarge differences amongst populations.

— as it is the case with therapeutical drugs, for instance (85 % of drugs are only made available to the rich — 19 % of the world's population).

— given the economic expectations at stake industries avoid doing research in monogenic diseases — the so called "orphan diseases" whose incidence is very low and just do research in poligenic diseases caused by different genes and that are more frequently presented on cancer, diabetes, asthma or cardiovascular diseases (hypertension, hypercholesterolemia, etc.) but whose incidence makes them more profitable to the pharmaceutical industries.

— predictive tests (insurance policies, work force testing, diagnostic purposes with aggression to intimacy, etc.) that might restrict social promotion chances for affected individuals or potential candidates to a genetically inherited disease.

— it might favour massive unemployment (as in the case of the agroalimentary sector).

*Note: The present article reflects in part criteria and conceptions already stated elsewhere by the author.

3) The selective utilization (racial selection, mental manipulation, indigenous populations, warriors or servants, etc.).

4) The production of chemical and bacteriological weapons aimed at extermination.

5) The release of genetically engineered microorganisms; the resulting pathogenesis of mutations, etc.

6) Damage to biodiversity (to animals and their species; to vegetables, to traditional agricultural practices and to natural areas; alterations in microorganisms; appearance of new strains, etc.)

7) Damage to the environment: pollution and degradation subsequent to residual waste; deforestation and desertisation.

8) Last but not least, we are on the way to achieving total control over genes. We have already succeeded in mapping the human genome and the genomes of smaller species: we can "see" them, copy them, retrieve them, cut them, stick them together, recombine them with other genes of the same or different species, perform with them and, in short, we can translate this knowledge into scientific and technological realities. Some day not too much afar the *homo sapiens* will be able to "turn" genes to his/her own benefit and interest: genes will become "domesticated" to serve a pre-determined purpose under the direction of the human will and whim.

In the event a "fully tamed genome" were eventually achieved — and once genetic determinism is done away with for good by our own desire — won't the human being in us, which has been gifted and engineered to reason, but capable of re-inventing him/herself at every level (that's why I have come to term it *anthropoplastic or bioplastic*) end up manoeuvring with its life uncontrollably whilst harming the future generations on the way. Won't it, then, end up destroying itself through the artificial hampering of its natural evolution and the evolution of the species to which it belongs, and consequently destroying the world in which we live?

Bioethics

The term Bioethics is due to the North-american oncologist Van Rensselaer Potter, a fervent promoter of this new discipline. I would define Bioethics as "the ethics discipline committedly implied (at societal and practical levels) in every problem resulting from the applications of science and technology on *bios*, life in general, and more particularly on human life, with the aim of prevent and avoid abuse", that is to say, "the discipline in charge of the analysis of scientific and technical performances so as to set the ethical postulates that will reconcile the utilization of progress made in these fields with the utmost respect for human dignity and for the conservation of the Biosphere".

Thus, Bioethics is above all, a tool for coexisting, for living together, a discipline aiming at har-

monizing scientific and technical progress with life; a tool to establish the framework and subsequent guidelines that will serve to resolve conflicts arising between society and the individual or between Nature and scientific and technical applications. Bioethics provides the desirable humanistic link to the fast moving scientific and technological worlds.

The conflicts herein mentioned are but a reflection of the complexities of the modern world where Bioethics must seek the balance of interests and provide useful guidelines. The task of Bioethics is everything but simple because of:

1) the relativism of ethics;

2) the underlying interests at stake to which Bioethics cannot remain neutral for, should it tilt towards the defense of economic values it would end up in a calculator; whereas if only taking into account ideologies or religious values, it might end up inducing fundamentalist ideas. Those, of course, cannot be the aims of Bioethics.

Here and there with greater or lesser incidence, but nevertheless everywhere in the globe, people talk about Bioethics, they write about Bioethics, they discuss Bioethics in different forums — public, private, scientific and academic — but, about the likely ethical implications of biotechnologies to the extent that, little by little, a Bioethics Culture has been settling in. This implies that a rigorous and objective assessment of the impact of biotechnological progress is been made. And that, of course, calls for a definition of "progress" from positive standpoints and for the implementation of the necessary measures to put scientific and technical progress to the service of Man and that without inflicting any free-of-charge damage.

Bioethics integrates and represents the conventional world wide ethics accepted which are indispensable for the protection of the collective dignity; its postulates ought to go beyond the "minimum requirements", and must be drafted aside from external influences or pressures of any sort; that is, guidelines that in spite of different opinions might be ordinarily applied for the common good. I am making reference to the so called "civil ethics", that is "ethics whose validity is supported on the acceptance of reality once it has been weighed, argued and contrasted against rational criteria and put at the service of the common good". This means that a Bioethics of "minimums" will not suffice, not unless these are in agreement with the social aims pursued, particularly if taking into account that joint deliberation and decision-making requires the exercise of consensus and agreement which, in turn, will expose ethical conceptions and behaviours that may range to extremes within any discussion group. The Bioethics imperative calls for the pursuit of common objectives, a balanced view on things. In short, Bioethics responds to an attitude, a most homogeneous attitude, at practical and territorial

level and thus, it cannot move across a band of extreme oscillations in the limits of contradiction. Neither it has to resolve insufficiently, that is, responding under the standards of influence nor seeking excellency for all and every one human being. Rather, Bioethics is to pursue the appropriate behaviour and performance, as human dignity is in itself the exponent of individual behaviour, thus, we are to achieve collective dignity — not meaning to deny or demand excellency as a personal or professional end.

Bioethics is a civil tool for the arbitrage between science and technology on one hand, and the human community of which they are patrimony, on the other. In a sense, it is a relatively efficient chain of wills, where a link will eventually be faulty due to an "empty" unproductive discussion and, thus, once accepted the fact that Bioethics is no panacea to ever find a balance in the resolution of problems, it seems right for society to set legal rules or biolaws and try to solve those problems in the context of Law. Things as they are, it is essential to accept that "there is no problem specific to Bioethics", but rather problems caused by the application of biology, medicine or bioindustries: damage to the environment, the quality of our foodstuffs, utilization and consumption, etc. Problems upon which Bioethics reflects and tries to provide specific and positive answers.

If the advantages of biotechnology are many and unrefutable when put at the service and benefit of the individual and collective well being, one will also have to admit that some biotechniques — more precisely genetic engineering — have a dark side, and pose a worrying concern that makes them non-desirable under ethical standards because they pose a threat to privacy and the most intimate sphere of the human being, even susceptible of violating the fundamental rights of the individual: its existence, its dignity and its liberty, or compromising the future of generations to come. Bioethics is, therefore, attentive to everything that concerns people, and humanity as a whole; whatever concerns the Earth in which they live and get life from, and that with the understanding that science and technology are their patrimony. Those fundamental rights and principles are contained in the Universal Declaration of Human Rights (1948); the European Convention on the Protection of Human Rights and Fundamental Freedoms (1950); in the Social European Chart (1961); the International Agreement on Civil and Political Rights (1966); the Bioethics Convention of Asturias (Council of Europe, 1997) on Human Rights and Biomedicine and other international agreements or conventions. Their demands will only realize if effective compliance with specific and universal principles is achieved; among others:

— The respect for the life of the person, for personal security and the protection of the person against inhuman or degrading treatments, be it physical, psychological or moral.

— The self-determination and responsibility of an individual to make his/her own decisions, having as only restriction to the exercise of his/her freedom those established under Art. 29 of the Universal Declaration of Human Rights and Art. 53 and others of the Constitution.

— The non-discrimination for social, medical, labor, contractual, etc. reasons.

— The informed consent prior to any intervention, and freely delivered, with special protection due to the rights of those legally unable to give consent (the under-age, etc.).

— The right to privacy, in particular with regard to the individual's genetic data, which implies both the right to know and the right not to know.

— The respect for the individual's genetic heritage, which cannot be manipulated or modified in detriment of the individual's own interest or of his/her offspring, nor used to select individuals or particular racial traits.

— The rejection of biotechnologies which are abusive in nature, aiming at inflicting suffering, extermination or responding to belical aims.

The thing is that Biotechnology has come to stay and that many corporations are being created to develop it further yet with significant investment and increasing research practices. We are witnessing a real biological and industrial revolution where resources are jointly put together (multinational corporations, universities, or public entities), in a fashion of a triggering ensembles for an ever increasing market of complex technologies and their outputs in the fields of industry, medicine, pharmaceuticals, food sector, environment, etc.

Consequently, biotechnology is power. Science and Technology have been said to be neither good or bad. They will be qualified as one or the other according to the application we make of their achievements, the aims pursued and the consequences they will bring about. Bioethics must grow and mature rapidly so that it can guide interventions when and where needed upon the basis of deep reflection, free of individual interests, on how the proposals put forward by some may affect others. In this sense, it would be useful to introduce pragmatic elements in the reflection and deliberations. Moreover, it must assess to what extent objections made to some particular aspect of scientific or technological development would suffice to deny those who do not share the same ideas the opportunity to benefit from their use; it will also promote the right to express a response when and where as needed and that without having to do so "behind" or "beyond" the social reality and demands.